

COVER SHEET TO AMENDMENT 7

INTERNATIONAL STANDARDS  
AND RECOMMENDED PRACTICES

# OPERATION OF AIRCRAFT

ANNEX 6  
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

PART III  
INTERNATIONAL OPERATIONS — HELICOPTERS

FOURTH EDITION OF PART III — JULY 1998

INTERNATIONAL CIVIL AVIATION ORGANIZATION

## Checklist of Amendments to Annex 6, Part III

	<i>Effective date</i>	<i>Date of applicability</i>
Fourth Edition (incorporates Amendments 1-5)	20 July 1998	5 November 1998
Amendment 6 (adopted by the Council on 15 March 1999)	19 July 1999	4 November 1999
Amendment 7 (adopted by the Council on 15 March 2000) New and replacement pages (iv), (xiii), 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 37, 39, 40, 41 and 42	17 July 2000	2 November 2000



*Transmittal note*

**Amendment 7**

**to the**

**International Standards and  
Recommended Practices**

**OPERATION OF AIRCRAFT**

**(Annex 6, Part III to the Convention on International Civil Aviation)**

1. Insert the following new and replacement pages in Annex 6, Part III (Fourth Edition) to incorporate Amendment 7 which becomes applicable on 2 November 2000:

- |                                    |                          |
|------------------------------------|--------------------------|
| a) Page (iv)                       | — Table of Contents      |
| b) Page (xiii)                     | — Foreword               |
| c) Pages 1, 2, 3, 4, 5 and 6       | — Section I, Chapter 1   |
| d) Pages 10, 11, 12, 13, 14 and 15 | — Section II, Chapter 2  |
| e) Page 37                         | — Section III, Chapter 1 |
| f) Pages 39, 40, 41 and 42         | — Section III, Chapter 2 |

2. Record the entry of this amendment on page (ii).

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17/7/00

COVER SHEET TO AMENDMENT 6

INTERNATIONAL STANDARDS  
AND RECOMMENDED PRACTICES

# OPERATION OF AIRCRAFT

ANNEX 6  
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

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Fourth Edition (incorporates Amendments 1-5)	20 July 1998	5 November 1998
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**Amendment 6**

to the

**International Standards and  
Recommended Practices**

**OPERATION OF AIRCRAFT**

(Annex 6, Part III to the Convention on International Civil Aviation)

1. Insert the following replacement pages in Annex 6, Part III (Fourth Edition) to incorporate Amendment 6 which becomes applicable on 4 November 1999:

- |                                |                          |
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| b) Page (xiii)                 | — Foreword               |
| c) Page 1 and 2                | — Section I, Chapter 1   |
| d) Pages 13 and 14             | — Section II, Chapter 2  |
| e) Pages 20, 21, 23, 24 and 25 | — Section II, Chapter 4  |
| f) Page 35                     | — Section II, Chapter 10 |
| g) Pages 47, 48, 48A and 48B   | — Section III, Chapter 4 |
| h) Page 53                     | — Appendix               |

2. Record the entry of this amendment on page (ii).

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19/7/99

INTERNATIONAL STANDARDS  
AND RECOMMENDED PRACTICES

**OPERATION OF AIRCRAFT**

**ANNEX 6**

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

**PART III  
INTERNATIONAL OPERATIONS — HELICOPTERS**

**FOURTH EDITION OF PART III — JULY 1998**



**This edition incorporates all amendments adopted by the Council prior to 21 March 1998 and supersedes, on 5 November 1998, all previous editions of Part III of Annex 6.**

**For information regarding the applicability of the Standards and Recommended Practices, see Foreword.**

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**INTERNATIONAL STANDARDS  
AND RECOMMENDED PRACTICES**

**OPERATION OF AIRCRAFT**

**ANNEX 6**

**TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

**PART III  
INTERNATIONAL OPERATIONS — HELICOPTERS**

**FOURTH EDITION OF PART III — JULY 1998**

**This edition incorporates all amendments adopted by the Council prior to 21 March 1998 and supersedes, on 5 November 1998, all previous editions of Part III of Annex 6.**

**For information regarding the applicability of the Standards and Recommended Practices, *see* Foreword.**

**INTERNATIONAL CIVIL AVIATION ORGANIZATION**

## AMENDMENTS

The issue of amendments is announced regularly in the *ICAO Journal* and in the monthly *Supplement to the Catalogue of ICAO Publications and Audio-Visual Training Aids*, which holders of this publication should consult. The space below is provided to keep a record of such amendments.

## RECORD OF AMENDMENTS AND CORRIGENDA

[illegible][illegible]

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# ABBREVIATIONS AND SYMBOLS (used in this Annex)

## Abbreviations

ADREP	Accident/incident reporting
AFCs	Automatic flight control system
AIG	Accident investigation and prevention
AOC	Air operator certificate
ATC	Air traffic control
ATS	Air traffic services
CAT I	Category I
CAT II	Category II
CAT III	Category III
CAT IIIA	Category IIIA
CAT IIIB	Category IIIB
CAT IIIC	Category IIIC
CDL	Configuration deviation list
CFIT	Controlled flight into terrain
cm	Centimetre
CRM	Cockpit resource management
CVR	Cockpit voice recorder
DA	Decision altitude
DA/H	Decision altitude/height
DH	Decision height
DME	Distance measuring equipment
Distance DR	The horizontal distance that the helicopter has travelled from the end of the take-off distance available
ECAM	Electronic centralized aircraft monitor
EFIS	Electronic flight instrument system
EGT	Exhaust gas temperature
EICAS	Engine indication and crew alerting system
ELT	Emergency locator transmitter
ELT(AF)	Automatic fixed ELT
ELT(AP)	Automatic portable ELT
ELT(AD)	Automatically deployable ELT
ELT(S)	Survival ELT
EUROCAE	European Organization for Civil Aviation Electronics
EPR	Engine pressure ratio
FATO	Final approach and take-off area
FDAU	Flight data acquisition unit
FDR	Flight data recorder
FM	Frequency modulation
ft	Foot
g	Normal acceleration
hPa	Hectopascal
IFR	Instrument flight rules
IMC	Instrument meteorological conditions
INS	Inertial navigation system

## Abbreviations

kg	Kilogram
km	Kilometre
LDAH	Landing distance available
LDP	Landing decision point
LDRH	Landing distance required
LOFT	Line-oriented flight training
m	Metre
MDA	Minimum descent altitude
MDA/H	Minimum descent altitude/height
MDH	Minimum descent height
MEL	Minimum equipment list
MHz	Megahertz
MMEL	Master minimum equipment list
NAV	Navigation
N1	High pressure turbine speed
NM	Nautical mile
OCA	Obstacle clearance altitude
OCA/H	Obstacle clearance altitude/height
OCH	Obstacle clearance height
PNR	Point of no return
R	Rotor radius
RNP	Required navigation performance
RTODR	Rejected take-off distance required
RVR	Runway visual range
SAR	Search and rescue
SI	International System of Units
SICASP	Secondary Surveillance Radar Improvements and Collision Avoidance Systems Panel
SOP	Standard operating procedures
TDP	Take-off decision point
TLOF	Touchdown and lift-off area
TODAH	Take-off distance available
TODRH	Take-off distance required
UTC	Universal co-ordinated time
VFR	Visual flight rules
VMC	Visual meteorological conditions
V <sub>TOSS</sub>	The minimum speed at which climb shall be achieved with the critical power-unit inoperative, the remaining power-units operating within approved operating limits
V <sub>y</sub>	Best rate of climb speed
WXR	Weather

## Symbols

°C	Degrees Celsius
%	Per cent

## Publications

## Annex 6 — Operation of Aircraft

**PUBLICATIONS**  
(referred to in this Annex)

*Convention on International Civil Aviation* (Doc 7300)

European Organization for Civil Aviation Electronics  
(EUROCAE) Documents ED55 and ED56A

*Nationality and Registration of Aircraft Operated by International  
Operating Agencies* (Doc 8722) (Replaced by *Policy and Guidance  
Material on the Regulation of International Air Transport*  
(Doc 9587))

*Protocol Relating to an Amendment to the Convention on  
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Annexes to the Convention on International Civil Aviation

*Annex 1 — Personnel Licensing*

*Annex 2 — Rules of the Air*

*Annex 3 — Meteorological Service for International Air Navigation*

*Annex 4 — Aeronautical Charts*

*Annex 5 — Units of Measurement to be Used in Air and  
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Systems*; Part II — *Voice Communication Systems*)

Volume IV (*Surveillance Radar and Collision  
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*Annex 11 — Air Traffic Services*

*Annex 12 — Search and Rescue*

*Annex 13 — Aircraft Accident Investigation*

*Annex 14 — Aerodromes*

Volume I — *Aerodrome Design and Operations*  
Volume II — *Heliports*

*Annex 15 — Aeronautical Information Services*

*Annex 16 — Environmental Protection*  
Volume I — *Aircraft Noise*

*Annex 18 — The Safe Transport of Dangerous Goods by Air*

Procedures for Air Navigation Services

*OPS — Aircraft Operations* (Doc 8168)

Volume I — *Flight Procedures*

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(Doc 4444)

*Regional Supplementary Procedures* (Doc 7030)

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*Accident/Incident Reporting Manual (ADREP Manual)*  
(Doc 9156)

*Accident Prevention Manual* (Doc 9422)

*Airport Services Manual* (Doc 9137)

Part 1 — *Rescue and Fire Fighting*

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*Airworthiness Technical Manual* (Doc 9051)

*Manual of Aircraft Ground De/Anti-icing Operations* (Doc 9640)

*Manual of Procedures for Operations Inspection,  
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*Manual on Required Navigation Performance (RNP)* (Doc 9613)

*Preparation of an Operations Manual* (Doc 9376)

Circulars

*Flight Crew Fatigue and Flight Time Limitations* (Circ. 52)

*Human Factors Digest No. 1 — Fundamental Human Factors  
Concepts* (Circ. 216)

*Human Factors Digest No. 2 — Flight Crew Training: Cockpit  
Resource Management (CRM) and Line-Oriented  
Flight Training (LOFT)* (Circ. 217)

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and Organization* (Circ. 247)

*Human Factors Digest No. 12 — Human Factors in Aircraft  
Maintenance and Inspection* (Circ. 253)

## ANNEX 6 — PART III INTERNATIONAL OPERATIONS — HELICOPTERS

### FOREWORD

#### Historical background

Standards and Recommended Practices for the Operation of Aircraft were first adopted by the Council, pursuant to the provisions of Article 37 of the Convention on International Civil Aviation (Chicago 1944), on 10 December 1948 for International Air Transport and on 2 December 1968 for International General Aviation. The documents containing these Standards and Recommended Practices are now designated as Annex 6, Parts I and II, respectively, to the Convention. In general, Parts I and II address aeroplane operations; neither part is specifically applicable to helicopter operations.

Therefore, Part III was introduced as a means of including provisions for helicopter operations. Initially, provisions related to flight data recorders and cockpit voice recorders for helicopters were developed by the Air Navigation Commission following Recommendation 10/1 of the Accident Prevention and Investigation Meeting AIG, (1979) and adopted by the Council on 14 March 1986. They became effective on 27 July 1986 and applicable on 20 November 1986. Subsequently, proposals for comprehensive Standards and Recommended Practices covering other aspects of helicopter operations were developed with the assistance of the Helicopter Operations Panel; these provisions, incorporated in Amendment 1, were adopted by the Council on 21 March 1990. The amendment became effective on 30 July 1990 and applicable on 15 November 1990.

Table A shows the origin of subsequent amendments together with a list of the principal subjects involved and the dates on which the Annex and the amendments were adopted by the Council, when they became effective and when they became applicable.

#### Applicability

The Standards and Recommended Practices included in Annex 6 — Operation of Aircraft, Parts I and II, cover the operation of all aeroplanes in international civil aviation, except where specifically excluded. Similarly, the Standards and Recommended Practices in Annex 6, Part III, cover the operation of all helicopters in international civil aviation, general aviation as well as commercial air transport operations.

#### Action by Contracting States

*Notification of differences.* The attention of Contracting States is drawn to the obligation imposed by Article 38 of the Convention by which Contracting States are required to notify the Organization of any differences between their national regulations and practices and the International Standards contained in this Annex and any amendments thereto. Contracting States are invited to extend such notification to any differences from the Recommended Practices contained in this Annex, and any amendments thereto when the notification of such differences is important for the safety of air navigation. Further, Contracting States are invited to keep the Organization currently informed of any differences which may subsequently occur, or of the withdrawal of any differences previously notified. A specific request for notification of differences will be sent to Contracting States immediately after the adoption of each Amendment to this Annex.

Attention of States is also drawn to the provision of Annex 15 related to the publication of differences between their national regulations and practices and the related ICAO Standards and Recommended Practices through the Aeronautical Information Service, in addition to the obligation of States under Article 38 of the Convention.

*Promulgation of information.* The establishment and withdrawal of and changes to facilities, services and procedures affecting aircraft operations provided in accordance with the Standards and Recommended Practices specified in this Annex should be notified and take effect in accordance with the provisions of Annex 15.

#### Status of Annex components

An Annex is made up of the following component parts, not all of which, however, are necessarily found in every Annex; they have the status indicated:

##### 1. — *Material comprising the Annex proper:*

- a) *Standards and Recommended Practices* adopted by the Council under the provisions of the Convention. They are defined as follows:

*Standard:* Any specification for physical characteristics, configuration, matériel, performance, personnel or procedure, the uniform application of which is



**Annex 6 — Operation of Aircraft**

recognized as necessary for the safety or regularity of international air navigation and to which Contracting States will conform in accordance with the Convention; in the event of impossibility of compliance, notification to the Council is compulsory under Article 38.

**Recommended Practice:** Any specification for physical characteristics, configuration, matériel, performance, personnel or procedure, the uniform application of which is recognized as desirable in the interest of safety, regularity or efficiency of international air navigation, and to which Contracting States will endeavour to conform in accordance with the Convention.

- b) *Appendices* comprising material grouped separately for convenience but forming part of the Standards and Recommended Practices adopted by the Council.
- c) *Definitions* of terms used in the Standards and Recommended Practices which are not self-explanatory in that they do not have accepted dictionary meanings. A definition does not have independent status but is an essential part of each Standard and Recommended Practice in which the term is used, since a change in the meaning of the term would affect the specification.
- d) *Tables* and *Figures* which add to or illustrate a Standard or Recommended Practice and which are referred to therein, form part of the associated Standard or Recommended Practice and have the same status.

It is to be noted that some Standards in this Annex may incorporate, by reference, other specifications having the status of Recommended Practices. In such case, the text of the Recommended Practice becomes part of the Standard.

**2. — Material approved by the Council for publication in association with the Standards and Recommended Practices:**

- a) *Forewords* comprising historical and explanatory material based on the action of the Council and including an explanation of the obligations of States with regard to the application of the Standards and Recommended Practices ensuing from the Convention and the Resolution of Adoption;
- b) *Introductions* comprising explanatory material introduced at the beginning of parts, chapters or

**Part III**

sections of the Annex to assist in the understanding of the application of the text;

- c) *Notes* included in the text, where appropriate, to give factual information or references bearing on the Standards or Recommended Practices in question, but not constituting part of the Standards or Recommended Practices;
- d) *Attachments* comprising material supplementary to the Standards and Recommended Practices, or included as a guide to their application.

**Selection of language**

This Annex has been adopted in five languages — English, Arabic, French, Russian and Spanish. Each Contracting State is requested to select one of those texts for the purpose of national implementation and for other effects provided for in the Convention, either through direct use or through translation into its own national language, and to notify the Organization accordingly.

**Editorial practices**

The following practice has been adhered to in order to indicate at a glance the status of each statement: *Standards* have been printed in light face roman; *Recommended Practices* have been printed in light face italics, the status being indicated by the prefix **Recommendation**; *Notes* have been printed in light face italics, the status being indicated by the prefix *Note*.

The following editorial practice has been followed in the writing of specifications: for Standards the operative verb “shall” is used, and for Recommended Practices the operative verb “should” is used.

The units of measurement used in this document are in accordance with the International System of Units (SI) as specified in Annex 5 to the Convention on International Civil Aviation. Where Annex 5 permits the use of non-SI alternative units these are shown in parentheses following the basic units. Where two sets of units are quoted it must not be assumed that the pairs of values are equal and interchangeable. It may, however, be inferred that an equivalent level of safety is achieved when either set of units is used exclusively.

Any reference to a portion of this document, which is identified by a number and/or title, includes all subdivisions of that portion.

Throughout this Annex, the use of the male gender should be understood to include male and female persons.

## Foreword

## Annex 6 — Operation of Aircraft

Table A. Amendments to Annex 6, Part III

<i>Amendment</i>	<i>Source</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
1st Edition	Accident Prevention and Investigation Divisional Meeting AIG (1979)	Provisions for flight recorders in helicopters.	14 March 1986 27 July 1986 20 November 1986
1 (2nd Edition)	Fourth Meeting of the Helicopter Operations Panel. Amendments consequential to 1990 amendments to Annex 6, Parts I and II. Air Navigation Commission — directed studies.	a) Introduction of provisions pertaining to helicopter operations, similar in scope to those contained in Annex 6, Parts I and II, for aeroplanes. These provisions, together with the flight recorder provisions previously introduced in the First Edition of Annex 6, Part III, complete the initial development of Standards and Recommended Practices for helicopter operations; b) introduction of provisions pertaining to the air operator certificate, minimum equipment lists, the operations manual, and some new definitions. These provisions serve to preserve the parallelism among the three parts of Annex 6; c) introduction of guidance material concerning recording on FDRs of operational flight information for those helicopters equipped with electronic displays.	21 March 1990 30 July 1990 15 November 1990
2	Fifth meeting of the Operations Panel, Eighth meeting of the Review of the General Concept of Separation Panel, Accident Investigation Divisional Meeting (AIG/1992), Air Navigation Commission studies.	a) Revision of definitions of heliport operating minima, decision altitude/height, minimum descent altitude/height and introduction of definition of obstacle clearance altitude/height; b) introduction of new definitions for emergency locator transmitters (ELTs), required navigation performance (RNP) and RNP type; c) introduction of a requirement concerning the use of engraving metal foil flight data recorders; d) introduction of carriage requirements for emergency locator transmitters (ELTs) to replace provisions regarding survival radio equipment and emergency location beacon; e) introduction of a requirement that the navigation equipment carried shall enable the aircraft to proceed in accordance with RNP types prescribed for the intended route(s) or areas(s).	21 March 1994 25 July 1994 10 November 1994
3 (3rd Edition)	Air Navigation Commission studies, Fourteenth meeting of the Dangerous Goods Panel, editorial amendment, text alignment with Annex 6, Part I and/or Part II, consequential amendment.	a) Introduction of new and revised definitions; b) new provisions concerning accident prevention and flight safety programmes; c) revision of the provisions concerning operating facilities, in-flight simulation of emergency situations, minimum flight altitudes, flight time, flight duty periods and rest periods for crew members, flight preparation, oxygen supply, flight crew members at duty stations, duties of flight operations officers and new provisions for carry-on baggage;	10 March 1995 24 July 1995 9 November 1995

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<i>Amendment</i>	<i>Source</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
		<ul style="list-style-type: none"> <li>d) revision of provisions concerning mass limitations and medical supplies;</li> <li>e) new provisions related to oxygen equipment, revision of the provisions for helicopters operated in accordance with visual flight rules (VFR) and instrument flight rules (IFR);</li> <li>f) new requirements for the flight crew training programme concerning knowledge and skills related to human performance and limitations;</li> <li>g) revision of the denomination of flight operations officers to align with Annex 1;</li> <li>h) revision of the contents of the operations manual; new provisions concerning heliport operating minima, oxygen supply, flight and duty time limitations, procedures and checklists used by flight crew, specifications for the operational flight plan, the flight crew training programme, the cabin attendant duties training programme, security instruction and guidance, accident prevention and flight safety programme, departure contingency procedures and instructions for mass and balance control;</li> <li>i) new provisions on flight time, flight duty periods and rest periods for cabin attendants and revision of the provisions concerning training;</li> <li>j) revision of the provisions concerning first-aid medical supplies; and</li> <li>k) new provisions concerning the minimum equipment list (MEL).</li> </ul>	
4	Fourth meeting of the Secondary Surveillance Radar Improvements and Collision Avoidance Systems Panel (SICASP/4)	Requirement for helicopters to be equipped with pressure-altitude reporting transponders.	19 February 1996 15 July 1996 7 November 1996
5 (4th Edition)	First meeting of the Flight Recorder Panel, ICAO and Industry CFIT Task Force, Air Navigation Commission studies, Amendment 162 to Annex 1, Amendment 38 to Annex 11, editorial amendment	<ul style="list-style-type: none"> <li>a) Introduction of new and revised definitions for aircraft operating manual, configuration deviation list, human factors principles, human performance, master minimum equipment list, psychoactive substances and required navigation performance;</li> <li>b) revision of the notes concerning lease and interchange;</li> <li>c) introduction of a note concerning the use of psychoactive substances;</li> <li>d) new and revised requirements concerning flight recorders;</li> <li>e) new and revised provisions concerning the content of an operations manual relocated in an appendix;</li> <li>f) new provisions concerning the responsibility of States with regard to supervision of operations subject to an air operator certificate, acceptance of an operations manual and establishment of a system for certification and continued surveillance of the operator;</li> <li>g) new provisions related to the de/anti-icing of aircraft on the ground, aeroplane performance operating limitations, mass limitations, sensitive pressure altimeters and recent experience of the co-pilot;</li> </ul>	20 March 1998 20 July 1998 5 November 1998

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<i>Amendment</i>	<i>Source</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
		h) revised provisions concerning pressure-altitude reporting transponders; and	
		i) new provisions concerning Human Factors.	
6	Second meeting of the Flight Recorder Panel, 32nd Session of the Assembly, Air Navigation Commission studies	a) Change of terminology from “cabin attendant” to “cabin crew”;	15 March 1999
		b) revised definitions;	19 July 1999
		c) new provisions concerning the mandatory carriage of ELTs operating on 406 MHz and 121.5 MHz, pressure-altitude reporting transponders and the introduction of an implementation date for the recording of digital communications.	4 November 1999
7	Air Navigation Commission studies	a) Revised definitions and introduction of the definition for instrument approach and landing operations; and	15 March 2000
		b) introduction of requirements for the provision of RVR information and criteria for instrument approach operations, revision of the duties of the pilot-in-command.	17 July 2000 2 November 2000

## **ANNEX 6 — PART III**

### **SECTION I**

### **GENERAL**

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# INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES

## CHAPTER 1. DEFINITIONS

When the following terms are used in the Standards and Recommended Practices for international operations with helicopters, they have the following meanings:

**Aerial work.** An aircraft operation in which an aircraft is used for specialized services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, aerial advertisement, etc.

**Aircraft.** Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

**Aircraft operating manual.** A manual, acceptable to the State of the Operator, containing normal, abnormal and emergency procedures, checklists, limitations, performance information, details of the aircraft systems and other material relevant to the operation of the aircraft.

*Note.— The aircraft operating manual is part of the operations manual.*

**Air operator certificate (AOC).** A certificate authorizing an operator to carry out specified commercial air transport operations.

**Alternate heliport.** A heliport specified in the flight plan to which a flight may proceed when it becomes inadvisable to land at the heliport of intended landing.

*Note.— An alternate heliport may be the heliport of departure.*

**Approach and landing phase — helicopters.** That part of the flight from 300 m (1 000 ft) above the elevation of the FATO, if the flight is planned to exceed this height, or from the commencement of the descent in the other cases, to landing or to the balked landing point.

**Cabin crew member.** A crew member who performs, in the interest of safety of passengers, duties assigned by the operator or the pilot-in-command of the aircraft, but who shall not act as a flight crew member.

**Commercial air transport operation.** An aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire.

**Configuration deviation list (CDL).** A list established by the organization responsible for the type design with the approval of the State of Design which identifies any external parts of an aircraft type which may be missing at the commencement of a flight, and which contains, where necessary, any information on associated operating limitations and performance correction.

**Congested area.** In relation to a city, town or settlement, any area which is substantially used for residential, commercial or recreational purposes.

**Crew member.** A person assigned by an operator to duty on an aircraft during a flight duty period.

**Dangerous goods.** Articles or substances which are capable of posing significant risk to health, safety or property when transported by air.

*Note.— Dangerous goods are classified in Annex 18, Chapter 3.*

**Decision altitude (DA) or decision height (DH).** A specified altitude or height in the precision approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

*Note 1.— Decision altitude (DA) is referenced to mean sea level and decision height (DH) is referenced to the threshold elevation.*

*Note 2.— The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In Category III operations with a decision height the required visual reference is that specified for the particular procedure and operation.*

*Note 3.— For convenience where both expressions are used they may be written in the form "decision altitude/height" and abbreviated "DA/H".*

**Defined point after take-off.** The point, within the take-off and initial climb phase, before which the helicopter's ability to continue the flight safely, with one engine inoperative, is not assured and a forced landing may be required.

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**Defined point before landing.** The point, within the approach and landing phase, after which the helicopter's ability to continue the flight safely, with one engine inoperative, is not assured and a forced landing may be required.

*Note.— Defined points apply to performance Class 2 helicopters only.*

**Elevated heliport.** A heliport located on a raised structure on land.

**Emergency locator transmitter (ELT).** A generic term describing equipment which broadcast distinctive signals on designated frequencies and, depending on application, may be automatically activated by impact or be manually activated. An ELT may be any of the following:

**Automatic fixed ELT (ELT(AF)).** An automatically activated ELT which is permanently attached to an aircraft.

**Automatic portable ELT (ELT(AP)).** An automatically activated ELT which is rigidly attached to an aircraft but readily removable from the aircraft.

**Automatic deployable ELT (ELT(AD)).** An ELT which is rigidly attached to an aircraft and which is automatically deployed and activated by impact, and, in some cases, also by hydrostatic sensors. Manual deployment is also provided.

**Survival ELT (ELT(S)).** An ELT which is removable from an aircraft, stowed so as to facilitate its ready use in an emergency, and manually activated by survivors.

**En-route phase.** That part of the flight from the end of the take-off and initial climb phase to the commencement of the approach and landing phase.

*Note.— Where adequate obstacle clearance cannot be guaranteed visually, flights must be planned to ensure that obstacles can be cleared by an appropriate margin. In the event of failure of the critical power-unit, operators may need to adopt alternative procedures.*

**Final approach and take-off area (FATO).** A defined area over which the final phase of the approach manoeuvre to hover or landing is completed and from which the take-off manoeuvre is commenced. Where the FATO is to be used by performance Class 1 helicopters, the defined area includes the rejected take-off area available.

**Flight crew member.** A licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period.

**Flight duty period.** The total time from the moment a flight crew member commences duty, immediately subsequent to a rest period and prior to making a flight or a series of flights, to the moment the flight crew member is relieved of all duties having completed such flight or series of flights.

**Flight manual.** A manual, associated with the certificate of airworthiness, containing limitations within which the aircraft is to be considered airworthy, and instructions and information necessary to the flight crew members for the safe operation of the aircraft.

**Flight plan.** Specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aircraft.

**Flight recorder.** Any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation.

**Flight time — helicopters.** The total time from the moment a helicopter's rotor blades start turning until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades are stopped.

**General aviation operation.** An aircraft operation other than a commercial air transport operation or an aerial work operation.

**Helicopter.** A heavier-than-air aircraft supported in flight chiefly by the reactions of the air on one or more power-driven rotors on substantially vertical axes.

**Helideck.** A heliport located on a floating or fixed off-shore structure.

**Heliport.** An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.

**Heliport operating minima.** The limits of usability of a heliport for:

- a) take-off, expressed in terms of runway visual range and/or visibility and, if necessary, cloud conditions;
- b) landing in precision approach and landing operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) as appropriate to the category of the operation; and
- c) landing in non-precision approach and landing operations, expressed in terms of visibility and/or runway visual range, minimum descent altitude/height (MDA/H) and, if necessary, cloud conditions.

**Human Factors principles.** Principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

**Human performance.** Human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

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**Instrument approach and landing operations.** Instrument approach and landing operations using instrument approach procedures are classified as follows:

**Non-precision approach and landing operations.** An instrument approach and landing which does not utilize electronic glide path guidance.

**Precision approach and landing operations.** An instrument approach and landing using precision azimuth and glide path guidance with minima as determined by the category of operation.

**Categories of precision approach and landing operations:**

**Category I (CAT I) operation.** A precision instrument approach and landing with a decision height not lower than 60 m (200 ft) and with either a visibility not less than 800 m or a runway visual range not less than 550 m.

**Category II (CAT II) operation.** A precision instrument approach and landing with a decision height lower than 60 m (200 ft), but not lower than 30 m (100 ft), and a runway visual range not less than 350 m.

**Category IIIA (CAT IIIA) operation.** A precision instrument approach and landing with:

- a) a decision height lower than 30 m (100 ft) or no decision height; and
- b) a runway visual range not less than 200 m.

**Category IIIB (CAT IIIB) operation.** A precision instrument approach and landing with:

- a) a decision height lower than 15 m (50 ft) or no decision height; and
- b) a runway visual range less than 200 m but not less than 50 m.

**Category IIIC (CAT IIIC) operation.** A precision instrument approach and landing with no decision height and no runway visual range limitations.

*Note.— Where decision height (DH) and runway visual range (RVR) fall into different categories of operation, the instrument approach and landing operation would be conducted in accordance with the requirements of the most demanding category (e.g. an operation with a DH in the range of CAT IIIA but with an RVR in the range of CAT IIIB would be considered a CAT IIIB operation or an operation with a DH in the range of CAT II but with an RVR in the range of CAT I would be considered a CAT II operation).*

**Instrument meteorological conditions (IMC).** Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling\*, less than the minima specified for visual meteorological conditions.

*Note.— The specified minima for visual meteorological conditions are contained in Chapter 4 of Annex 2.*

**Landing decision point (LDP).** The point used in determining landing performance from which, a power-unit failure occurring at this point, the landing may be safely continued or a balked landing initiated.

*Note.— LDP applies to performance Class 1 helicopters.*

**Master minimum equipment list (MMEL).** A list established for a particular aircraft type by the organization responsible for the type design with the approval of the State of Design containing items, one or more of which is permitted to be unserviceable at the commencement of a flight. The MMEL may be associated with special operating conditions, limitations or procedures.

**Maximum mass.** Maximum certificated take-off mass.

**Minimum descent altitude (MDA) or minimum descent height (MDH).** A specified altitude or height in a non-precision approach or circling approach below which descent must not be made without the required visual reference.

*Note 1.— Minimum descent altitude (MDA) is referenced to mean sea level and minimum descent height (MDH) is referenced to the aerodrome elevation or to the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. A minimum descent height for a circling approach is referenced to the aerodrome elevation.*

*Note 2.— The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In the case of a circling approach the required visual reference is the runway environment.*

*Note 3.— For convenience when both expressions are used they may be written in the form "minimum descent altitude/height" and abbreviated "MDA/H".*

**Minimum equipment list (MEL).** A list which provides for the operation of aircraft, subject to specified conditions, with particular equipment inoperative, prepared by an operator in conformity with, or more restrictive than, the MMEL established for the aircraft type.

**Night.** The hours between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise, as may be prescribed by the appropriate authority.

\* As defined in Annex 2.



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## Part III

*Note.*— Civil twilight ends in the evening when the centre of the sun's disc is 6 degrees below the horizon and begins in the morning when the centre of the sun's disc is 6 degrees below the horizon.

**Obstacle clearance altitude (OCA) or obstacle clearance height (OCH).** The lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria.

*Note 1.*— Obstacle clearance altitude is referenced to mean sea level and obstacle clearance height is referenced to the threshold elevation or in the case of non-precision approaches to the aerodrome elevation or the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. An obstacle clearance height for a circling approach is referenced to the aerodrome elevation.

*Note 2.*— For convenience when both expressions are used they may be written in the form "obstacle clearance altitude/height" and abbreviated "OCA/H".

**Operational control.** The exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of the flight.

**Operational flight plan.** The operator's plan for the safe conduct of the flight based on considerations of helicopter performance, other operating limitations and relevant expected conditions on the route to be followed and at the heliports concerned.

**Operations manual.** A manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties.

**Operator.** A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

**Performance Class 1 helicopter.** A helicopter with performance such that, in case of critical power-unit failure, it is able to land on the rejected take-off area or safely continue the flight to an appropriate landing area, depending on when the failure occurs.

**Performance Class 2 helicopter.** A helicopter with performance such that, in case of critical power-unit failure, it is able to safely continue the flight, except when the failure occurs prior to a defined point after take-off or after a defined point before landing, in which cases a forced landing may be required.

**Performance Class 3 helicopter.** A helicopter with performance such that, in case of power-unit failure at any point in the flight profile, a forced landing must be performed.

**Pilot-in-command.** The pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight.

**Psychoactive substances.** Alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, other psychostimulants, hallucinogens, and volatile solvents, whereas coffee and tobacco are excluded.

**Required navigation performance (RNP).** A statement of the navigation performance necessary for operation within a defined airspace.

*Note.*— Navigation performance and requirements are defined for a particular RNP type and/or application.

**Rest period.** Any period of time on the ground during which a flight crew member is relieved of all duties by the operator.

**RNP type.** A containment value expressed as a distance in nautical miles from the intended position within which flights would be for at least 95 per cent of the total flying time.

*Example.*— RNP 4 represents a navigation accuracy of plus or minus 7.4 km (4 NM) on a 95 per cent containment basis.

**Runway visual range (RVR).** The range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line.

**Safe forced landing.** Unavoidable landing or ditching with a reasonable expectancy of no injuries to persons in the aircraft or on the surface.

**State of Registry.** The State on whose register the aircraft is entered.

*Note.*— In the case of the registration of aircraft of an international operating agency on other than a national basis, the States constituting the agency are jointly and severally bound to assume the obligations which, under the Chicago Convention, attach to a State of Registry. See, in this regard, the Council Resolution of 14 December 1967 on Nationality and Registration of Aircraft Operated by International Operating Agencies (Doc 8722).

**State of the Operator.** The State in which the operator's principal place of business is located or, if there is no such place of business, the operator's permanent residence.

**Synthetic flight trainer.** Any one of the following three types of apparatus in which flight conditions are simulated on the ground:

A flight simulator, which provides an accurate representation of the flight deck of a particular aircraft type to

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the extent that the mechanical, electrical, electronic, etc., aircraft systems control functions, the normal environment of flight crew members, and the performance and flight characteristics of that type of aircraft are realistically simulated;

*A flight procedures trainer*, which provides a realistic flight deck environment, and which simulates instrument responses, simple control functions of mechanical, electrical, electronic, etc., aircraft systems, and the performance and flight characteristics of aircraft of a particular class;

*A basic instrument flight trainer*, which is equipped with appropriate instruments, and which simulates the flight deck environment of an aircraft in flight in instrument flight conditions.

**Take-off and initial climb phase.** That part of the flight from the start of take-off to 300 m (1 000 ft) above the elevation of the FATO, if the flight is planned to exceed this height, or to the end of the climb in the other cases.

**Take-off decision point (TDP).** The point used in determining take-off performance from which, a power-unit failure

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occurring at this point, either a rejected take-off may be made or a take-off safely continued.

*Note.— TDP applies to performance Class 1 helicopters.*

**Visual meteorological conditions (VMC).** Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling,\* equal to or better than specified minima.

*Note.— The specified minima are contained in Chapter 4 of Annex 2.*

**$V_{TOSS}$**  The minimum speed at which climb shall be achieved with the critical power-unit inoperative, the remaining power-units operating within approved operating limits.

*Note.— The speed referred to above may be measured by instrument indications or achieved by a procedure specified in the flight manual.*

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\* As defined in Annex 2.

## CHAPTER 2. APPLICABILITY

The Standards and Recommended Practices contained in Annex 6, Part III, shall be applicable to all helicopters engaged in international commercial air transport operations or in international general aviation operations, except that these Standards and Recommended Practices are not applicable to helicopters engaged in aerial work.

*Note 1.— Standards and Recommended Practices applicable to the operation of aeroplanes by operators authorized to conduct international commercial air transport operations are to be found in Annex 6, Part I.*

*Note 2.— Standards and Recommended Practices applicable to international general aviation operations with aeroplanes are to be found in Annex 6, Part II.*

**ANNEX 6 — PART III**

**SECTION II**

**INTERNATIONAL COMMERCIAL AIR TRANSPORT**

**5/11/98**

## CHAPTER 1. GENERAL

*Note 1.— Although the Convention on International Civil Aviation allocates to the State of Registry certain functions which that State is entitled to discharge, or obligated to discharge, as the case may be, the Assembly recognized, in Resolution A23-13 that the State of Registry may be unable to fulfil its responsibilities adequately in instances where aircraft are leased, chartered or interchanged — in particular without crew — by an operator of another State and that the Convention may not adequately specify the rights and obligations of the State of an operator in such instances until such time as Article 83 bis of the Convention enters into force. Accordingly, the Council urged that if, in the above-mentioned instances, the State of Registry finds itself unable to discharge adequately the functions allocated to it by the Convention, it delegate to the State of the Operator, subject to acceptance by the latter State, those functions of the State of Registry that can more adequately be discharged by the State of the Operator. It was understood that pending entry into force of Article 83 bis of the Convention the foregoing action would only be a matter of practical convenience and would not affect either the provisions of the Chicago Convention prescribing the duties of the State of Registry or any third State. However, as Article 83 bis of the Convention entered into force on 20 June 1997, such transfer agreements will have effect in respect of Contracting States which have ratified the related Protocol (Doc 9318) upon fulfilment of the conditions established in Article 83 bis.*

*Note 2.— In the case of international operations effected jointly with helicopters not all of which are registered in the same Contracting State, nothing in this Part of the Annex prevents the States concerned entering into an agreement for the joint exercise of the functions placed upon the State of Registry by the provisions of the relevant Annexes.*

1.1 Operators shall ensure that their employees when abroad know that they must comply with the laws, regulations and procedures of the States in which their helicopters are operated.

1.2 Operators shall ensure that all pilots are familiar with the laws, regulations and procedures, pertinent to the performance of their duties, prescribed for the areas to be traversed, the heliports to be used and the air navigation facilities relating thereto. The operator shall ensure that other members of the flight crew are familiar with such of these regulations and procedures as are pertinent to the performance of their respective duties in the operation of the helicopter.

1.3 An operator or a designated representative shall have responsibility for operational control.

*Note.— The rights and obligations of a State in respect to the operation of helicopters registered in that State are not affected by this provision.*

1.4 If an emergency situation which endangers the safety of the helicopter or persons necessitates the taking of action which involves a violation of local regulations or procedures, the pilot-in-command shall notify the appropriate local authority without delay. If required by the State in which the incident occurs, the pilot-in-command shall submit a report on any such violation to the appropriate authority of such State; in that event, the pilot-in-command shall also submit a copy of it to the State of the Operator. Such reports shall be submitted as soon as possible and normally within ten days.

1.5 Operators shall ensure that pilots-in-command have available on board the helicopter all the essential information concerning the search and rescue services in the area over which the helicopter will be flown.

*Note.— This information may be made available to the pilot by means of the operations manual or such other means as is considered appropriate.*

1.6 An operator shall establish and maintain an accident prevention and flight safety programme.

*Note.— Guidance on accident prevention is contained in the Accident Prevention Manual (Doc 9422) and in the manual Preparation of an Operations Manual (Doc 9376).*

1.7 Dangerous goods.

*Note 1.— Provisions for carriage of dangerous goods are contained in Annex 18.*

*Note 2.— Article 35 of the Convention refers to certain classes of cargo restrictions.*

1.8 Use of psychoactive substances.

*Note.— Provisions concerning the use of psychoactive substances are contained in Annex 1, 1.2.7 and Annex 2, 2.5.*

## CHAPTER 2. FLIGHT OPERATIONS

### 2.1 Operating facilities

2.1.1 An operator shall ensure that a flight will not be commenced unless it has been ascertained by every reasonable means available that the ground and/or water facilities available and directly required on such flight, for the safe operation of the helicopter and the protection of the passengers, are adequate for the type of operation under which the flight is to be conducted and are adequately operated for this purpose.

*Note.— “Reasonable means” in this Standard is intended to denote the use, at the point of departure, of information available to the operator either through official information published by the aeronautical information services or readily obtainable from other sources.*

2.1.2 An operator shall ensure that any inadequacy of facilities observed in the course of operations is reported to the authority responsible for them, without undue delay.

2.1.3 Subject to their published conditions of use, heliports and their facilities shall be kept continuously available for flight operations during their published hours of operations, irrespective of weather conditions.

### 2.2 Operational certification and supervision

#### 2.2.1 The air operator certificate

2.2.1.1 An operator shall not engage in commercial air transport operations unless in possession of a valid air operator certificate or equivalent document issued by the State of the Operator.

2.2.1.2 The air operator certificate or equivalent document shall authorize the operator to conduct commercial air transport operations in accordance with such conditions and limitations as may be specified.

2.2.1.3 The issue of an air operator certificate or equivalent document by the State of the Operator shall be dependent upon the operator demonstrating an adequate organization, method of control and supervision of flight operations, training programme and maintenance arrangements consistent with the nature and extent of the operations specified.

*Note.— Attachment F to Part I of Annex 6 contains guidance on the issue of an air operator certificate.*

2.2.1.4 The continued validity of an air operator certificate or equivalent document shall depend upon the operator maintaining the requirements of 2.2.1.3 under the supervision of the State of the Operator.

2.2.1.5 The air operator certificate or equivalent document shall contain at least the following:

- a) operator's identification (name, location);
- b) date of issue and period of validity;
- c) description of the types of operations authorized;
- d) the type(s) of aircraft authorized for use; and
- e) authorized areas of operation or routes.

2.2.1.6 The State of the Operator shall establish a system for both the certification and the continued surveillance of the operator to ensure that the required standards of operations established in 2.2 are maintained.

#### 2.2.2 Operations manual

2.2.2.1 An operator shall provide, for the use and guidance of operations personnel concerned, an operations manual in accordance with the Appendix. The operations manual shall be amended or revised as is necessary to ensure that the information contained therein is kept up to date. All such amendments or revisions shall be issued to all personnel that are required to use this manual.

2.2.2.2 The State of the Operator shall establish a requirement for the operator to provide a copy of the operations manual together with all amendments and/or revisions, for review and acceptance and, where required, approval. The operator shall incorporate in the operations manual such mandatory material as the State of the Operator may require.

*Note 1.— Requirements for the contents of an operations manual are provided in the Appendix.*

*Note 2.— Specific items in an operations manual require the approval of the State of the Operator in accordance with the Standards in Section II, 2.2.7, 4.1.2, 7.3.1 and 10.3.*

#### 2.2.3 Operating instructions — general

2.2.3.1 An operator shall ensure that all operations personnel are properly instructed in their particular duties and

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responsibilities and the relationship of such duties to the operation as a whole.

2.2.3.2 A helicopter rotor shall not be turned under power without a qualified pilot at the controls.

2.2.3.3 **Recommendation.**— *The operator should issue operating instructions and provide information on helicopter climb performance with all engines operating to enable the pilot-in-command to determine the climb gradient that can be achieved during the take-off and initial climb phase for the existing take-off conditions and intended take-off technique. This information should be included in the operations manual.*

### 2.2.4 In-flight simulation of emergency situations

An operator shall ensure that when passengers or cargo are being carried, no emergency or abnormal situations shall be simulated.

### 2.2.5 Checklists

The checklists provided in accordance with 4.1.3 shall be used by flight crews prior to, during and after all phases of operations, and in emergency, to ensure compliance with the operating procedures contained in the aircraft operating manual, the flight manual or other documents associated with the certificate of airworthiness and otherwise in the operations manual. The design and utilization of checklists shall observe human factors principles.

*Note.*— *Guidance material on the application of human factors principles can be found in Circular 216 (Human Factors Digest No. 1 — Fundamental Human Factors Concepts), Circular 238 (Human Factors Digest No. 6 — Ergonomics) and Circular 247 (Human Factors Digest No. 10 — Human Factors, Management and Organization).*

### 2.2.6 Minimum flight altitudes

2.2.6.1 An operator shall be permitted to establish minimum flight altitudes for those routes flown for which minimum flight altitudes have been established by the State flown over or the responsible State, provided that they shall not be less than those established by that State, unless specifically approved.

2.2.6.2 An operator shall specify the method by which it is intended to determine minimum flight altitudes for operations conducted over routes for which minimum flight altitudes have not been established by the State flown over, or the responsible State, and shall include this method in the

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operations manual. The minimum flight altitudes determined in accordance with the above method shall not be lower than specified in Annex 2.

2.2.6.3 **Recommendation.**— *The method for establishing the minimum flight altitudes should be approved by the State of the Operator.*

2.2.6.4 **Recommendation.**— *The State of the Operator should approve such method only after careful consideration of the probable effects of the following factors on the safety of the operation in question:*

- a) *the accuracy and reliability with which the position of the helicopter can be determined;*
- b) *the inaccuracies in the indications of the altimeters used;*
- c) *the characteristics of the terrain (e.g. sudden changes in the elevation);*
- d) *the probability of encountering unfavourable meteorological conditions (e.g. severe turbulence and descending air currents);*
- e) *possible inaccuracies in aeronautical charts; and*
- f) *airspace restrictions.*

### 2.2.7 Heliport operating minima

2.2.7.1 The State of the Operator shall require that the operator establish heliport operating minima for each heliport to be used in operations and shall approve the method of determination of such minima. Such minima shall not be lower than any that may be established for such heliports by the State in which the heliport is located, except when specifically approved, by that State.

*Note.*— *This Standard does not require the State in which the heliport is located to establish heliport operating minima.*

2.2.7.2 The State of the Operator shall require that in establishing the heliport operating minima which will apply to any particular operation, full account shall be taken of:

- a) *the type, performance and handling characteristics of the helicopter;*
- b) *the composition of the flight crew, their competence and experience;*
- c) *the declared distances;*
- d) *the adequacy and performance of the available visual and non-visual ground aids;*

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- e) the equipment available on the helicopter for the purpose of navigation and/or control of the flight path during the approach to landing and the missed approach;
- f) the obstacles in the approach and missed approach areas and the obstacle clearance altitude/height for the instrument approach procedures;
- g) the means used to determine and report meteorological conditions; and
- h) the obstacles in the climb-out areas and necessary clearance margins.

2.2.7.3 Category II and Category III instrument approach and landing operations shall not be authorized unless RVR information is provided.

2.2.7.4 **Recommendation.**— *For instrument approach and landing operations, heliport operating minima below 800 m visibility should not be authorized unless RVR information or an accurate measurement or observation of visibility is provided.*

*Note.*— *Guidance on the operationally desirable and currently attainable accuracy of measurement or observation is given in Annex 3 — Meteorological Service for International Air Navigation, Attachment B.*

**2.2.8 Fuel and oil records**

2.2.8.1 An operator shall maintain fuel and oil records to enable the State of the Operator to ascertain that, for each flight, the requirements of 2.3.6 have been complied with.

2.2.8.2 Fuel and oil records shall be retained by the operator for a period of three months.

**2.2.9 Crew**

2.2.9.1 *Pilot-in-command.* For each flight, the operator shall designate one pilot to act as pilot-in-command.

2.2.9.2 *Flight time, flight duty periods and rest periods.* An operator shall formulate rules to limit flight time and flight duty periods and for the provision of adequate rest periods for all its crew members. These rules shall be in accordance with the regulations established by the State of the Operator, or approved by that State, and included in the operations manual.

2.2.9.3 An operator shall maintain current records of the flight time, flight duty periods and rest periods of all its crew members.

*Note.*— *Guidance on the establishment of limitations is given in Attachment C.*

**2.2.10 Passengers**

2.2.10.1 An operator shall ensure that passengers are made familiar with the location and use of:

- a) seat belts;
- b) emergency exits;
- c) life jackets, if the carriage of life jackets is prescribed;
- d) oxygen dispensing equipment, if the provision of oxygen for the use of passengers is prescribed; and
- e) other emergency equipment provided for individual use, including passenger emergency briefing cards.

2.2.10.2 The operator shall inform the passengers of the location and general manner of use of the principal emergency equipment carried for collective use.

2.2.10.3 In an emergency during flight, passengers shall be instructed in such emergency action as may be appropriate to the circumstances.

2.2.10.4 The operator shall ensure that during take-off and landing and whenever, by reason of turbulence or any emergency occurring during flight, the precaution is considered necessary, all passengers on board a helicopter shall be secured in their seats by means of the seat belts or harnesses provided.

**2.2.11 Over-water flights**

All helicopters on flights over water in accordance with 4.5.1 shall be certificated for ditching. Sea state shall be an integral part of ditching information.

**2.3 Flight preparation**

2.3.1 A flight shall not be commenced until flight preparation forms have been completed certifying that the pilot-in-command is satisfied that:

- a) the helicopter is airworthy;
- b) the instruments and equipment prescribed in Chapter 4, for the particular type of operation to be undertaken, are installed and are sufficient for the flight;
- c) a maintenance release as prescribed in 6.7 has been issued in respect of the helicopter;
- d) the mass of the helicopter and centre of gravity location are such that the flight can be conducted safely, taking into account the flight conditions expected;



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- e) any load carried is properly distributed and safely secured;
- f) a check has been completed indicating that the operating limitations of Chapter 3 can be complied with for the flight to be undertaken; and
- g) the Standards of 2.3.3 relating to operational flight planning have been complied with.

2.3.2 Completed flight preparation forms shall be kept by an operator for a period of three months.

**2.3.3 Operational flight planning**

2.3.3.1 An operational flight plan shall be completed for every intended flight. The operational flight plan shall be approved and signed by the pilot-in-command and, where applicable, signed by the flight operations officer/flight dispatcher, and a copy shall be filed with the operator or a designated agent, or, if these procedures are not possible, it shall be left with the heliport authority or on record in a suitable place at the point of departure.

*Note.— The duties of a flight operations officer/flight dispatcher are contained in 2.6.*

2.3.3.2 The operations manual must describe the content and use of the operational flight plan.

**2.3.4 Alternate heliports**

2.3.4.1 For a flight to be conducted in accordance with the instrument flight rules, at least one suitable alternate shall be specified in the operational flight plan and the flight plan, unless:

- a) the duration of the flight and the meteorological conditions prevailing are such that there is reasonable certainty that, at the estimated time of arrival at the heliport of intended landing, and for a reasonable period before and after such time, the approach and landing may be made under visual meteorological conditions as prescribed by the State of the Operator; or
- b) the heliport of intended landing is isolated and no suitable alternate is available. A point of no return (PNR) shall be determined.

2.3.4.2 Suitable off-shore alternates may be specified subject to the following:

- the off-shore alternates shall be used only after a point of no return (PNR). Prior to PNR on-shore alternates shall be used;

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— mechanical reliability of critical control systems and critical components shall be considered and taken into account when determining the suitability of the alternates;

— one engine inoperative performance capability shall be attainable prior to arrival at the alternate;

— deck availability shall be guaranteed;

— weather information must be reliable and accurate.

*Note.— The landing technique specified in the flight manual following control system failure may preclude the nomination of certain helidecks as alternate heliports.*

**2.3.4.3 Recommendation.—** Off-shore alternates should not be used when it is possible to carry enough fuel to have an on-shore alternate. Such circumstances should be exceptional and should not include payload enhancement in adverse weather conditions.

**2.3.5 Weather conditions**

2.3.5.1 A flight to be conducted in accordance with the visual flight rules shall not be commenced unless current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions along the route or that part of the route to be flown under the visual flight rules will, at the appropriate time, be such as to render compliance with these rules possible.

2.3.5.2 A flight to be conducted in accordance with instrument flight rules shall not be commenced unless the information is available which indicates that conditions at the heliport of intended landing or, when an alternate is required, at least one alternate heliport will, at the estimated time of arrival, be at or above the heliport operating minima.

*Note.— It is the practice in some States to declare, for flight planning purposes, higher minima for a heliport when nominated as an alternate than for the same heliport when planned as that of intended landing.*

2.3.5.3 A flight to be operated in known or expected icing conditions shall not be commenced unless the helicopter is certificated and equipped to cope with such conditions.

2.3.5.4 A flight to be planned or expected to operate in suspected or known ground icing conditions shall not be commenced unless the helicopter has been inspected for icing and, if necessary, has been given appropriate de/anti-icing treatment. Accumulation of ice or other naturally occurring contaminants shall be removed so that the helicopter is kept in an airworthy condition prior to take-off.

*Note.— Guidance material is given in the Manual of Aircraft Ground De/Anti-Icing Operations (Doc 9640).*

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## Part III

## 2.3.6 Fuel and oil supply

2.3.6.1 *All helicopters.* A flight shall not be commenced unless, taking into account both the meteorological conditions and any delays that are expected in flight, the helicopter carries sufficient fuel and oil to ensure that it can safely complete the flight. In addition, a reserve shall be carried to provide for contingencies.

2.3.6.2 *Visual flight rules (VFR) operations.* The fuel and oil carried in order to comply with 2.3.6.1 shall, in the case of VFR operations, be at least the amount sufficient to allow the helicopter:

- a) to fly to the heliport to which the flight is planned;
- b) to fly thereafter for a period of 20 minutes at best-range speed plus 10 per cent of the planned flight time; and
- c) to have an additional amount of fuel, sufficient to provide for the increased consumption on the occurrence of any of the potential contingencies specified by the operator to the satisfaction of the State of the Operator.

2.3.6.3 *Instrument flight rules (IFR) operations.* The fuel and oil carried in order to comply with 2.3.6.1 shall, in the case of IFR operations, be at least the amount sufficient to allow the helicopter:

2.3.6.3.1 When an alternate is not required, in terms of 2.3.4.1 a), to fly to the heliport to which the flight is planned, and thereafter:

- a) to fly 30 minutes at holding speed at 450 m (1 500 ft) above the destination heliport under standard temperature conditions and approach and land; and
- b) to have an additional amount of fuel, sufficient to provide for the increased consumption on the occurrence of any of the potential contingencies specified by the operator to the satisfaction of the State of the Operator.

2.3.6.3.2 When an alternate is required, to fly to and execute an approach, and a missed approach, at the heliport to which the flight is planned, and thereafter:

- a) to fly to the alternate specified in the flight plan; and then
- b) to fly for 30 minutes at holding speed at 450 m (1 500 ft) above the alternate under standard temperature conditions, and approach and land; and
- c) to have an additional amount of fuel sufficient to provide for the increased consumption on the occurrence of any of the potential contingencies specified by the operator to the satisfaction of the State of the Operator.

2.3.6.3.3 When no suitable alternate is available, in terms of 2.3.4.1 b), to fly to the heliport to which the flight is planned and thereafter for a period of two hours at holding speed.

2.3.6.4 In computing the fuel and oil required in 2.3.6.1, at least the following shall be considered:

- a) meteorological conditions forecast;
- b) expected air traffic control routings and traffic delays;
- c) for IFR flight, one instrument approach at the destination heliport, including a missed approach;
- d) the procedures prescribed in the operations manual for loss of pressurization, where applicable, or failure of one power-unit while en route; and
- e) any other conditions that may delay the landing of the helicopter or increase fuel and/or oil consumption.

*Note.— Nothing in 2.3.6 precludes amendment of a flight plan in flight in order to re-plan the flight to another heliport, provided that the requirements of 2.3.6 can be complied with from the point where the flight has been replanned.*

## 2.3.7 Refuelling with passengers on board or rotors turning

**Recommendation.—** A helicopter should not be refuelled when passengers are embarking, on board, disembarking or when the rotor is turning unless the operator is granted specific authorization by the State of the Operator setting forth the conditions under which such fuelling may be carried out.

*Note 1.— Provisions concerning aircraft refuelling are contained in Annex 14, Volume I, and guidance on safe refuelling practices is contained in the Airport Services Manual (Doc 9137), Parts 1 and 8.*

*Note 2.— Additional precautions are required when refuelling with fuels other than aviation kerosene or when refuelling results in a mixture of aviation kerosene with other aviation turbine fuels, or when an open line is used.*

## 2.3.8 Oxygen supply

*Note.— Approximate altitudes in the Standard Atmosphere corresponding to the values of absolute pressure used in the text are as follows:*

Absolute pressure	Metres	Feet
700 hPa	3 000	10 000
620 hPa	4 000	13 000
376 hPa	7 600	25 000

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2.3.8.1 A flight to be operated at flight altitudes at which the atmospheric pressure in personnel compartments will be less than 700 hPa shall not be commenced unless sufficient stored breathing oxygen is carried to supply:

- a) all crew members and 10 per cent of the passengers for any period in excess of 30 minutes that the pressure in compartments occupied by them will be between 700 hPa and 620 hPa;
- b) the crew and passengers for any period that the atmospheric pressure in compartments occupied by them will be less than 620 hPa.

2.3.8.2 A flight to be operated with a pressurized helicopter shall not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all the crew members and passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurization, for any period that the atmospheric pressure in any compartment occupied by them would be less than 700 hPa. In addition, when the helicopter is operated at flight altitudes at which the atmospheric pressure is more than 376 hPa and cannot descend safely to a flight altitude at which the atmospheric pressure is equal to 620 hPa within four minutes, there shall be no less than a 10-minute supply for the occupants of the passenger compartment.

**2.4 In-flight procedures****2.4.1 Heliport operating minima**

2.4.1.1 A flight shall not be continued towards the heliport of intended landing, unless the latest available information indicates that at the expected time of arrival, a landing can be effected at that heliport, or at least one alternate heliport, in compliance with the operating minima established in accordance with 2.2.7.1.

2.4.1.2 An instrument approach shall not be continued beyond the outer marker fix in case of precision approach, or below 300 m (1 000 ft) above the heliport in case of non-precision approach, unless the reported visibility or controlling RVR is above the specified minimum.

2.4.1.3 If, after passing the outer marker fix in case of precision approach, or after descending below 300 m (1 000 ft) above the heliport in case of non-precision approach, the reported visibility or controlling RVR falls below the specified minimum, the approach may be continued to DA/H or MDA/H. In any case, a helicopter shall not continue its

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approach-to-land at any heliport beyond a point at which the limits of the operating minima specified for that heliport would be infringed.

**2.4.2 Meteorological observations**

*Note.— The procedures for making meteorological observations on board aircraft in flight and for recording and reporting them are contained in Annex 3, the PANS-RAC (Doc 4444) and the appropriate Regional Supplementary Procedures (Doc 7030).*

**2.4.3 Hazardous flight conditions**

Hazardous flight conditions encountered, other than those associated with meteorological conditions, shall be reported to the appropriate aeronautical station as soon as possible. The reports so rendered shall give such details as may be pertinent to the safety of other aircraft.

**2.4.4 Flight crew members at duty stations**

2.4.4.1 *Take-off and landing.* All flight crew members required to be on flight deck duty shall be at their stations.

2.4.4.2 *En route.* All flight crew members required to be on flight deck duty shall remain at their stations except when their absence is necessary for the performance of duties in connection with the operation of the helicopter or for physiological needs.

2.4.4.3 *Seat belts.* All flight crew members shall keep their seat belt fastened when at their stations.

2.4.4.4 *Safety harness.* Any flight crew member occupying a pilot's seat shall keep the safety harness fastened during the take-off and landing phases; all other flight crew members shall keep their safety harness fastened during the take-off and landing phases unless the shoulder straps interfere with the performance of their duties, in which case the shoulder straps may be unfastened but the seat belt must remain fastened.

*Note.— Safety harness includes shoulder straps and a seat belt which may be used independently.*

**2.4.5 Use of oxygen**

All flight crew members, when engaged in performing duties essential to the safe operation of a helicopter in flight, shall use breathing oxygen continuously whenever the circumstances prevail for which its supply has been required in 2.3.8.1 or 2.3.8.2.

**Annex 6 — Operation of Aircraft****Part III****2.4.6 Safeguarding of cabin crew and passengers in pressurized aircraft in the event of loss of pressurization**

**Recommendation.**— *Cabin crew should be safeguarded so as to ensure reasonable probability of their retaining consciousness during any emergency descent which may be necessary in the event of loss of pressurization and, in addition, they should have such means of protection as will enable them to administer first aid to passengers during stabilized flight following the emergency. Passengers should be safeguarded by such devices or operational procedures as will ensure reasonable probability of their surviving the effects of hypoxia in the event of loss of pressurization.*

*Note.*— *It is not envisaged that cabin crew will always be able to provide assistance to passengers during emergency descent procedures which may be required in the event of loss of pressurization.*

**2.4.7 In-flight operational instructions**

Operational instructions involving a change in the ATS flight plan shall, when applicable, be coordinated with the appropriate ATS unit before transmission to the helicopter.

*Note.*— *When the above coordination has not been possible, operational instructions do not relieve a pilot of the responsibility for obtaining an appropriate clearance from an ATS unit, if applicable, before making a change in flight plan.*

**2.4.8 Instrument flight procedures**

**2.4.8.1** One or more instrument approach procedures to serve each final approach and take-off area or heliport utilized for instrument flight operations shall be approved and promulgated by the State in which the heliport is located, or by the State which is responsible for the heliport when located outside the territory of any State.

**2.4.8.2** All helicopters operated in accordance with instrument flight rules shall comply with the instrument approach procedures approved by the State in which the heliport is located, or by the State which is responsible for the heliport when located outside the territory of any State.

*Note 1.*— *Operational procedures recommended for the guidance of operations personnel involved in instrument flight operations are described in PANS-OPS (Doc 8168), Volume I.*

*Note 2.*— *Criteria for the construction of instrument flight procedures for the guidance of procedure specialists are provided in PANS-OPS (Doc 8168), Volume II.*

**2.4.9 Helicopter operating procedures for noise abatement**

**Recommendation.**— *Noise abatement procedures specified by an operator for any one helicopter type should be the same for all heliports.*

**2.5 Duties of pilot-in-command**

**2.5.1** The pilot-in-command shall be responsible for the operation and safety of the helicopter and for the safety of all crew members, passengers and cargo on board, from the moment the engine(s) are started until the helicopter finally comes to rest at the end of the flight, with the engine(s) shut down and the rotor blades stopped.

**2.5.2** The pilot-in-command shall ensure that the checklists specified in 2.2.5 are complied with in detail.

**2.5.3** The pilot-in-command shall be responsible for notifying the nearest appropriate authority by the quickest available means of any accident involving the helicopter, resulting in serious injury or death of any person or substantial damage to the helicopter or property.

*Note.*— *A definition of the term "serious injury" is contained in Annex 13 and an explanation of the term "substantial damage" is given in the Accident/Incident Reporting Manual (ADREP Manual) (Doc 9156).*

**2.5.4** The pilot-in-command shall be responsible for reporting all known or suspected defects in the helicopter, to the operator, at the termination of the flight.

**2.5.5** The pilot-in-command shall be responsible for the journey log book or the general declaration containing the information listed in 9.4.1.

*Note.*— *By virtue of Resolution A10-36 of the Tenth Session of the Assembly (Caracas, June-July 1956) "the general declaration, [described in Annex 9] when prepared so as to contain all the information required by Article 34 [of the Convention on International Civil Aviation] with respect to the journey log book, may be considered by Contracting States to be an acceptable form of journey log book".*

**2.6 Duties of flight operations officer/flight dispatcher**

**2.6.1** A flight operations officer/flight dispatcher when employed in conjunction with a method of flight supervision in accordance with 2.2 shall:

- a) assist the pilot-in-command in flight preparation and provide the relevant information required;

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- b) assist the pilot-in-command in preparing the operational and the ATS flight plans, sign when applicable and file the ATS flight plan with the appropriate ATS unit;
- c) furnish the pilot-in-command while in flight, by appropriate means, with information which may be necessary for the safe conduct of the flight; and
- d) in the event of an emergency, initiate such procedures as may be outlined in the operations manual.

2.6.2 A flight operations officer/flight dispatcher shall avoid taking any action that would conflict with the procedures established by:

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- a) air traffic control;
- b) the meteorological service; or
- c) the communications service.

**2.7 Carry-on baggage**

The operator shall ensure that all baggage carried onto a helicopter and taken into the passenger cabin is adequately and securely stowed.

## CHAPTER 3. HELICOPTER PERFORMANCE OPERATING LIMITATIONS

### 3.1 General

3.1.1 Helicopters shall be operated in accordance with a comprehensive and detailed code of performance established by the State of Registry in compliance with the applicable Standards of this chapter.

3.1.2 Performance Class 3 helicopters shall only be operated in conditions of weather and light, and over such routes and diversions therefrom, that permit a safe forced landing to be executed in the event of engine failure. The conditions of this paragraph apply also to performance Class 2 helicopters prior to the defined point after take-off and after the defined point before landing.

3.1.3 **Recommendation.**— *For helicopters for which Part IV of Annex 8 is not applicable because of the exemption provided for in Article 41 of the Convention, the State of Registry should ensure that the level of performance specified in 3.2 should be met as far as practicable.*

3.1.4 Only performance Class 1 helicopters shall be permitted to operate from elevated heliports in congested areas.

3.1.5 **Recommendation.**— *Performance Class 3 helicopters should not be permitted to operate from elevated heliports or helidecks.*

### 3.2 Applicable to helicopters certificated in accordance with Part IV of Annex 8

3.2.1 The Standards contained in 3.2.2 to 3.2.7 inclusive are applicable to the helicopters to which Part IV of Annex 8 is applicable.

*Note.— The following Standards do not include quantitative specifications comparable to those found in national airworthiness codes. In accordance with 3.1.1, they are to be supplemented by national requirements prepared by Contracting States.*

3.2.2 The level of performance defined by the appropriate parts of the comprehensive and detailed national code referred to in 3.1.1 for the helicopters designated in 3.2.1 shall be at least substantially equivalent to the over-all level embodied in the Standards of this chapter.

*Note.— Attachment A contains guidance material which indicates, by an example, the level of performance intended by the Standards and Recommended Practices of this chapter.*

3.2.3 A helicopter shall be operated in compliance with the terms of its certificate of airworthiness and within the approved operating limitations contained in its flight manual.

3.2.4 The State of Registry shall take such precautions as are reasonably possible to ensure that the general level of safety contemplated by these provisions is maintained under all expected operating conditions, including those not covered specifically by the provisions of this chapter.

3.2.5 A flight shall not be commenced unless the performance information provided in the flight manual indicates that the Standards of 3.2.6 and 3.2.7 can be complied with for the flight to be undertaken.

3.2.6 In applying the Standards of this chapter, account shall be taken of all factors that significantly affect the performance of the helicopter (such as: mass, operating procedures, the pressure-altitude appropriate to the elevation of the operating site, temperature, wind and condition of the surface). Such factors shall be taken into account directly as operational parameters or indirectly by means of allowances or margins, which may be provided in the scheduling of performance data or in the comprehensive and detailed code of performance in accordance with which the helicopter is being operated.

### 3.2.7 Mass limitations

- a) The mass of the helicopter at the start of take-off shall not exceed the mass at which 3.2.7.1 is complied with, nor the mass at which 3.2.7.2 and 3.2.7.3 are complied with, allowing for expected reductions in mass as the flight proceeds, and for such fuel jettisoning as is envisaged in applying 3.2.7.2 and in respect of alternates 3.2.7 c) and 3.2.7.3.
- b) In no case shall the mass at the start of take-off exceed the maximum take-off mass specified in the flight manual for the pressure-altitude and temperature appropriate to the elevation of the operating site, and, if used as a parameter to determine the maximum take-off mass, any other local atmospheric condition.
- c) In no case shall the estimated mass for the expected time of landing at the destination and at any alternate, exceed the maximum landing mass specified in the flight manual for the pressure-altitude and

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temperature appropriate to the elevation of those operating sites, and, if used as a parameter to determine the maximum landing mass, any other local atmospheric condition.

- d) In no case shall the mass at the start of take-off, or at the expected time of landing at the destination and at any alternate, exceed the relevant maximum mass at which compliance has been demonstrated with the applicable noise certification Standards in Annex 16, Volume I, unless otherwise authorized in exceptional circumstances for a certain operating site where there is no noise disturbance problem, by the competent authority of the State in which the operating site is situated.

## 3.2.7.1 Take-off and initial climb phase

3.2.7.1.1 *For performance Class 1 helicopters.* The helicopter shall be able, in the event of the critical power-unit failing at or before the take-off decision point, to discontinue the take-off and stop within the rejected take-off area available, or, in the event of the failure occurring at or past the take-off decision point, to continue the take-off and then climb, clearing all obstacles along the flight path by an adequate margin until the helicopter is in a position to comply with 3.2.7.2.1.

3.2.7.1.2 *For performance Class 2 helicopters.* The helicopter shall be able, with all engines operating, to clear all obstacles along its flight path by an adequate margin until it is in a position to comply with 3.2.7.2.1. The helicopter shall be able, in the event of the critical power-unit becoming inoperative at any time after reaching a defined point after take-off, to continue the take-off and initial climb and clear all obstacles along its flight path by an adequate margin until it is in a position to comply with 3.2.7.2.1. Before the defined point, failure of a critical power-unit may cause the helicopter to force land, therefore the conditions stated in 3.1.2 shall apply before the defined point.

3.2.7.1.3 *For performance Class 3 helicopters.* The helicopter shall be able, with all engines operating, to clear all obstacles along its flight path by an adequate margin until it is in a position to comply with 3.2.7.2.2. At any point of the flight path, failure of a power-unit will cause the helicopter to force land, therefore the conditions stated in 3.1.2 shall apply.

## 3.2.7.2 En-route phase

3.2.7.2.1 *For performance Class 1 and Class 2 helicopters.* The helicopter shall be able, in the event of the critical

power-unit becoming inoperative at any point in the en-route phase, to continue the flight to an operating site at which the Standard of 3.2.7.3.1 for Class 1 helicopters, or the Standard of 3.2.7.3.2 for Class 2 helicopters can be met, without flying below the appropriate minimum flight altitude at any point. In the case of helicopters having three or more power-units, on any part of the route where the location of suitable intermediate operating sites and the total duration of the flight are such that the probability of a second power-unit becoming inoperative must be allowed for if the general level of safety implied by the Standard of this chapter is to be maintained, the helicopter shall be able, in the event of any two power-units becoming inoperative, to continue the flight to a suitable operating site and make a landing thereat.

3.2.7.2.2 *For performance Class 3 helicopters.* The helicopter shall be able, with all power-units operating, to continue along its intended route or planned diversions without flying at any point below the appropriate minimum flight altitude. At any point of the flight path, failure of a power-unit will cause the helicopter to force land, therefore the conditions stated in 3.1.2 shall apply.

## 3.2.7.3 Approach and landing phase

3.2.7.3.1 *For performance Class 1 helicopters.* In the event of the critical power-unit becoming inoperative at any point during the approach and landing phase, before the landing decision point, the helicopter shall, at the destination and at any alternate, after clearing all obstacles in the approach path by a safe margin, be able to land and stop within the landing distance available or to perform a balked landing and clear all obstacles in the flight path by an adequate margin equivalent to that specified in 3.2.7.1.1. In case of the failure occurring after the landing decision point, the helicopter shall be able to land and stop within the landing distance available.

3.2.7.3.2 *For performance Class 2 helicopters.* With all engines operating, the helicopter shall, at the destination and at any alternate, after clearing all obstacles in the approach path by a safe margin, be able either to land and stop within the landing distance available or to perform a balked landing and clear all obstacles in the flight path by an adequate margin equivalent to that specified in 3.2.7.1.2. In the event of the critical power-unit becoming inoperative before the defined point before landing, the same specifications are applicable. After the defined point, failure of a power-unit may cause the helicopter to force land, therefore the conditions stated in 3.1.2 shall apply.

3.2.7.3.3 *For performance Class 3 helicopters.* With all engines operating, the helicopter shall, at the destination and at any alternate, after clearing all obstacles in the approach path

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by a safe margin, be able to land and stop within the landing distance available or to perform a balked landing and clear all obstacles in the flight path by an adequate margin equivalent to that specified in 3.2.7.1.3. At any point of the flight path, failure of a power-unit will cause the helicopter to force land, therefore the conditions stated in 3.1.2 shall apply.

*Note.— “An adequate margin” referred to in these provisions, and applicable to all performance classes, is illustrated by the examples included in Attachment A to this Annex.*

**3.3 Obstacle data**

3.3.1 Obstacle data shall be provided to enable the operator to develop procedures to comply with 3.2.7.1 and 3.2.7.3.

*Note.— See Annex 4 and Annex 15 for methods of presentation of certain obstacle data.*

3.3.2 The operator shall take account of charting accuracy when assessing compliance with 3.2.7.1 and 3.2.7.3.



## CHAPTER 4. HELICOPTER INSTRUMENTS, EQUIPMENT, AND FLIGHT DOCUMENTS

*Note.— Specifications for the provision of helicopter communication and navigation equipment are contained in Chapter 5.*

### 4.1 General

4.1.1 In addition to the minimum equipment necessary for the issuance of a certificate of airworthiness, the instruments, equipment and flight documents prescribed in the following paragraphs shall be installed or carried, as appropriate, in helicopters according to the helicopter used and to the circumstances under which the flight is to be conducted.

4.1.2 The operator shall include in the operations manual a minimum equipment list (MEL), approved by the State of the Operator which will enable the pilot-in-command to determine whether a flight may be commenced or continued from any intermediate stop should any instrument, equipment or systems become inoperative.

*Note.— Attachment E contains guidance on the minimum equipment list.*

4.1.3 The operator shall provide operations staff and flight crew with an aircraft operating manual, for each aircraft type operated, containing the normal, abnormal and emergency procedures relating to the operation of the aircraft. The manual shall include details of the aircraft systems and of the checklists to be used.

### 4.2 All helicopters on all flights

4.2.1 A helicopter shall be equipped with instruments which will enable the flight crew to control the flight path of the helicopter, carry out any required procedural manoeuvres and observe the operating limitations of the helicopter in the expected operating conditions.

4.2.2 A helicopter shall be equipped with:

- a) one or more first-aid kits as appropriate to the number of passengers the helicopter is authorized to carry;

*Note.— Guidance on the contents of first-aid kits is given in Attachment D.*

- b) portable fire extinguishers of a type which, when discharged, will not cause dangerous contamination of the air within the helicopter. At least one shall be located in:

- 1) the pilot's compartment; and
- 2) each passenger compartment that is separate from the pilot's compartment and that is not readily accessible to the flight crew.

*Note.— Any portable fire extinguisher so fitted in accordance with the certificate of airworthiness of the helicopter may count as one prescribed.*

- c) 1) a seat or berth for each person over an age to be determined by the State of the Operator;
- 2) a seat belt for each seat and restraining belts for each berth; and
- 3) a safety harness for each flight crew seat. The safety harness for each pilot seat shall incorporate a device which will automatically restrain the occupant's torso in the event of rapid deceleration.

**Recommendation.—** *The safety harness for each pilot seat should incorporate a device to prevent a suddenly incapacitated pilot from interfering with the flight controls.*

*Note.— Safety harness includes shoulder straps and a seat belt which may be used independently.*

- d) means of ensuring that the following information and instructions are conveyed to passengers:
  - 1) when seat belts are to be fastened;
  - 2) when and how oxygen equipment is to be used if the carriage of oxygen is required;
  - 3) restrictions on smoking;
  - 4) location and use of life jackets or equivalent individual floatation devices where their carriage is required; and
  - 5) location and method of opening emergency exits; and
- e) spare electrical fuses of appropriate ratings for replacement of those accessible in flight.

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## 4.2.3 A helicopter shall carry:

- a) the operations manual prescribed in 2.2.2; or those parts of it that pertain to flight operations;
- b) the helicopter flight manual for the helicopter, or other documents containing performance data required for the application of Chapter 3 and any other information necessary for the operation of the helicopter within the terms of its certificate of airworthiness, unless these data are available in the operations manual; and
- c) current and suitable charts to cover the route of the proposed flight and any route along which it is reasonable to expect that the flight may be diverted.

## 4.2.4 Marking of break-in points

4.2.4.1 If areas of the fuselage suitable for break-in by rescue crews in an emergency are marked on a helicopter, such areas shall be marked as shown below (see figure following). The colour of the markings shall be red or yellow, and if necessary they shall be outlined in white to contrast with the background.

4.2.4.2 If the corner markings are more than 2 m apart, intermediate lines 9 cm x 3 cm shall be inserted so that there is no more than 2 m between adjacent markings.

*Note.— This Standard does not require any helicopter to have break-in areas.*

## 4.3 Flight recorders

*Note 1.— Flight recorders comprise two systems, a flight data recorder and a cockpit voice recorder.*

*Note 2.— Combination recorders (FDR/CVR) can only be used to meet the flight recorder equipage requirements as specifically indicated in this Annex.*

*Note 3.— Detailed guidance on flight recorders is contained in Attachment B.*

## 4.3.1 Flight data recorders — types

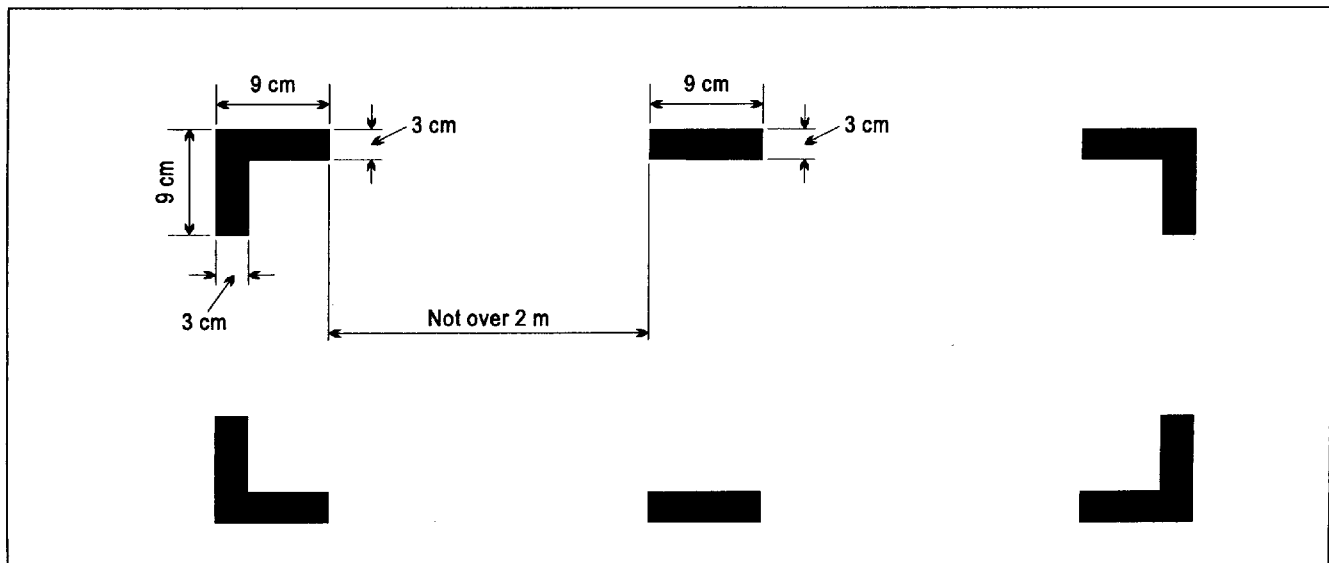
4.3.1.1 A Type IV flight data recorder shall record the parameters required to determine accurately the helicopter flight path, speed, attitude, engine power and operation.

4.3.1.2 A Type V flight data recorder shall record the parameters required to determine accurately the helicopter flight path, speed, attitude and engine power.

4.3.1.3 The use of engraving metal foil flight data recorders shall be discontinued by 1 January 1995.

4.3.1.4 **Recommendation.**— *The use of photographic film data recorders and analogue data recorders using frequency modulation (FM) should be discontinued by 5 November 1998.*

4.3.1.5 From 1 January 2005, all helicopters equipped to utilize digital communications and required to carry a cockpit



MARKING OF BREAK-IN POINTS (see 4.2.4)

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voice recorder shall record on the cockpit voice recorder or the flight data recorder the digital communications messages with ATS.

4.3.1.5.1 If recorded on the flight data recorder, the digital communications shall be readily correlatable to the cockpit voice recording.

**4.3.1.6 Recommendation.**— *All helicopters of a maximum certificated take-off mass over 2 700 kg, required to be equipped with a flight data recorder and/or a cockpit voice recorder, may alternatively be equipped with one combination recorder (FDR/CVR).*

## 4.3.2 Flight data recorders — duration

Types IV and V flight data recorders shall be capable of retaining the information recorded during at least the last ten hours of their operation.

**4.3.3 Flight data recorders — helicopters**  
for which the individual certificate  
of airworthiness is first issued  
on or after 1 January 1989

4.3.3.1 All helicopters of a maximum certificated take-off mass of over 7 000 kg shall be equipped with a Type IV flight data recorder.

**4.3.3.2 Recommendation.**— *All helicopters of a maximum certificated take-off mass of over 2 700 kg up to and including 7 000 kg should be equipped with a Type V flight data recorder.*

**4.3.4 Cockpit voice recorders — helicopters**  
for which the individual certificate  
of airworthiness is first issued  
on or after 1 January 1987

4.3.4.1 All helicopters of a maximum certificated take-off mass of over 7 000 kg shall be equipped with a cockpit voice recorder the objective of which is the recording of the aural environment on the flight deck during flight time. For helicopters not equipped with a flight data recorder, at least main rotor speed shall be recorded on one track of the cockpit voice recorder.

4.3.4.2 All helicopters of a maximum certificated take-off mass of over 2 700 kg up to and including 7 000 kg shall be equipped with a cockpit voice recorder the objective of which is the recording of the aural environment on the flight deck during flight time. For helicopters not equipped with a flight data recorder, at least main rotor speed shall be recorded on one track of the cockpit voice recorder.

**4.3.5 Cockpit voice recorders — helicopters**  
for which the individual certificate  
of airworthiness was first issued  
before 1 January 1987

All helicopters of a maximum certificated take-off mass of over 7 000 kg shall be equipped with a cockpit voice recorder, the objective of which is the recording of the aural environment on the flight deck during flight time. For helicopters not equipped with a flight data recorder, at least main rotor speed shall be recorded on one track of the cockpit voice recorder.

## 4.3.6 Cockpit voice recorders — duration

4.3.6.1 A cockpit voice recorder shall be capable of retaining the information recorded during at least the last 30 minutes of its operation.

**4.3.6.2 Recommendation.**— *A cockpit voice recorder, installed in helicopters for which the individual certificate of airworthiness is first issued on or after 1 January 1990, should be capable of retaining the information recorded during at least the last two hours of its operation.*

## 4.3.7 Flight recorders — construction and installation

Flight recorders shall be constructed, located and installed so as to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed. Flight recorders shall meet the prescribed crashworthiness and fire protection specifications.

*Note.*— *Industry crashworthiness and fire protection specifications can be found in documents such as the European Organization for Civil Aviation Electronics (EUROCAE) documents ED55 and ED56A.*

## 4.3.8 Flight recorders — operation

4.3.8.1 Flight recorders shall not be switched off during flight time.

4.3.8.2 To preserve flight recorder records, flight recorders shall be de-activated upon completion of flight time following an accident or incident. The flight recorders shall not be re-activated before their disposition as determined in accordance with Annex 13.

*Note 1.*— *The need for removal of the flight recorder records from the aircraft will be determined by the investigation authority in the State conducting the*

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*investigation with due regard to the seriousness of an occurrence and the circumstances, including the impact on the operation.*

*Note 2.— The operator's responsibilities regarding the retention of flight recorder records are contained in 9.6.*

**4.3.9 Flight recorders — continued serviceability**

Operational checks and evaluations of recordings from the flight data and cockpit voice recorder systems shall be conducted to ensure the continued serviceability of the recorders.

*Note.— Procedures for the inspections of the flight data and cockpit voice recorder systems are given in Attachment B.*

**4.4 All helicopters operated in accordance with visual flight rules**

4.4.1 All helicopters when operated in accordance with visual flight rules shall be equipped with:

- a) a magnetic compass;
- b) an accurate timepiece indicating the time in hours, minutes and seconds;
- c) a sensitive pressure altimeter;
- d) an airspeed indicator; and
- e) such additional instruments or equipment as may be prescribed by the appropriate authority.

4.4.2 VFR flights which are operated as controlled flights shall be equipped in accordance with 4.10.

**4.5 All helicopters on flights over water****4.5.1 Means of floatation**

All helicopters intended to be flown over water shall be fitted with a permanent or rapidly deployable means of floatation so as to ensure a safe ditching of the helicopter when:

- a) flying over water at a distance from land corresponding to more than 10 minutes at normal cruise speed in the case of performance Class 1 or 2 helicopters; or
- b) flying over water beyond autorotational or safe forced landing distance from land in the case of performance Class 3 helicopters.

**4.5.2 Emergency equipment**

4.5.2.1 Performance Class 1 and 2 helicopters, operating in accordance with the provisions of 4.5.1, shall be equipped with:

- a) one life jacket, or equivalent individual floatation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided;
- b) life-saving rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency, provided with such life-saving equipment including means of sustaining life as is appropriate to the flight to be undertaken; and
- c) equipment for making the pyrotechnical distress signals described in Annex 2.

4.5.2.2 Performance Class 3 helicopters when operating beyond autorotational distance from land but within a distance from land specified by the appropriate authority of the responsible State shall be equipped with one life jacket, or equivalent individual floatation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided.

*Note.— When determining the distance from land referred to in 4.5.2.2, consideration should be given to environmental conditions and the availability of SAR facilities.*

4.5.2.3 Performance Class 3 helicopters when operating outside the provisions of 4.5.2.2 shall be equipped as in 4.5.2.1.

4.5.2.4 In the case of performance Class 2 and Class 3 helicopters, when taking off or landing at a heliport where, in the opinion of the State of the Operator, the take-off or approach path is so disposed over water that in the event of a mishap there would be likelihood of a ditching, at least the equipment required in 4.5.2.1 a) shall be carried.

4.5.2.5 Each life jacket and equivalent individual floatation device, when carried in accordance with this 4.5, shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons.

**4.5.2.6 Recommendation.—** *On any helicopter for which the individual certificate of airworthiness is first issued on or after 1 January 1991, at least 50 per cent of the life rafts carried in accordance with the provisions of 4.5.2 should be deployable by remote control.*

**4.5.2.7 Recommendation.—** *Rafts which are not deployable by remote control and which have a mass of more than 40 kg should be equipped with some means of mechanically assisted deployment.*

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**4.5.2.8 Recommendation.**— *On any helicopter for which the individual certificate of airworthiness was first issued before 1 January 1991, the provisions of 4.5.2.6 and 4.5.2.7 should be complied with no later than 31 December 1992.*

#### 4.6 All helicopters on flights over designated land areas

Helicopters, when operated across land areas which have been designated by the State concerned as areas in which search and rescue would be especially difficult, shall be equipped with such signalling devices and life-saving equipment (including means of sustaining life) as may be appropriate to the area overflown.

#### 4.7 Emergency locator transmitter (ELT)

**4.7.1** Except as provided for in 4.7.2, until 1 January 2005 all Performance Class 1 and 2 helicopters operating on flights over water as described in 4.5.1 a) and Performance Class 3 helicopters operating as described in 4.5.1 b) shall be equipped with at least one ELT(S) per raft carried but not more than a total of two ELTs are required.

**4.7.2** Performance Class 1 and 2 helicopters for which the individual certificate of airworthiness is first issued after 1 January 2002, operating on flights over water as described in 4.5.1 a) and Performance Class 3 helicopters for which the individual certificate of airworthiness is first issued after 1 January 2002, operating as described in 4.5.1 b) shall be equipped with at least one automatic ELT and at least one ELT(S) in a raft.

**4.7.3** From 1 January 2005, all Performance Class 1 and 2 helicopters operating on flights over water as described in 4.5.1 a) and Performance Class 3 helicopters operating as described in 4.5.1 b) shall be equipped with at least one automatic ELT and at least one ELT(S) in a raft.

**4.7.4** Except as provided for in 4.7.5, until 1 January 2005 helicopters on flights over designated land areas as described in 4.6 shall be equipped with at least one ELT.

**4.7.5** Helicopters for which the individual certificate of airworthiness is first issued after 1 January 2002, on flights over designated land areas as described in 4.6 shall be equipped with at least one automatic ELT.

**4.7.6** From 1 January 2005, helicopters on flights over designated land areas as described in 4.6 shall be equipped with at least one automatic ELT.

**4.7.7 Recommendation.**— *All helicopters should carry an automatic ELT.*

**4.7.8** ELT equipment carried to satisfy the requirements of 4.7.1, 4.7.2, 4.7.3, 4.7.4, 4.7.5, 4.7.6 and 4.7.7 shall operate in accordance with the relevant provisions of Annex 10, Volume III.

#### 4.8 All helicopters on high altitude flights

*Note.*— *Approximate altitude in the Standard Atmosphere corresponding to the value of absolute pressure used in this text is as follows:*

Absolute pressure	Metres	Feet
700 hPa	3 000	10 000
620 hPa	4 000	13 000
376 hPa	7 600	25 000

**4.8.1** A helicopter intended to be operated at flight altitudes at which the atmospheric pressure is less than 700 hPa in personnel compartments shall be equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in 2.3.8.1.

**4.8.2** A helicopter intended to be operated at flight altitudes at which the atmospheric pressure is less than 700 hPa but which is provided with means of maintaining pressures greater than 700 hPa in personnel compartments shall be provided with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in 2.3.8.2.

**4.8.3** A helicopter intended to be operated at flight altitudes at which the atmospheric pressure is more than 376 hPa which cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa, and for which the individual certificate of airworthiness was issued on or after 9 November 1998, shall be provided with automatically deployable oxygen equipment to satisfy the requirements of 2.3.8.2. The total number of oxygen dispensing units shall exceed the number of passenger and cabin crew seats by at least 10 per cent.

**4.8.4 Recommendation.**— *A helicopter intended to be operated at flight altitudes at which the atmospheric pressure is more than 376 hPa which cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa, and for which the individual certificate of airworthiness is issued before 9 November 1998, should be provided with automatically deployable oxygen equipment to satisfy the requirements of 2.3.8.2. The total number of oxygen dispensing units should exceed the number of passenger and cabin crew seats by at least 10 per cent.*

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**4.9 All helicopters in icing conditions**

All helicopters shall be equipped with suitable anti-icing and/or de-icing devices when operated in circumstances in which icing conditions are reported to exist or are expected to be encountered.

**4.10 All helicopters operated in accordance with instrument flight rules**

4.10.1 All helicopters when operated in accordance with the instrument flight rules, or when the helicopter cannot be maintained in a desired attitude without reference to one or more flight instruments, shall be equipped with:

- a) a magnetic compass;
- b) an accurate timepiece indicating the time in hours, minutes and seconds;
- c) two sensitive pressure altimeters with counter drum-pointer or equivalent presentation;

*Note.— Neither three-pointer nor drum-pointer altimeters satisfy the requirement in c) above.*

- d) an airspeed indicating system with means of preventing malfunctioning due to either condensation or icing;
- e) a slip indicator;
- f) three attitude indicators (artificial horizon), one of which may be replaced by a turn indicator;
- g) a heading indicator (directional gyroscope);

*Note.— The requirements of e), f) and g) above may be met by combinations of instruments or by integrated flight director systems provided that the safeguards against total failure, inherent in the separate instruments, are retained.*

- h) a means of indicating whether the power supply to the gyroscopic instrument is adequate;
- i) a means of indicating in the flight crew compartment the outside air temperature;
- j) a rate of climb and descent indicator;
- k) a stabilization system, unless it has been demonstrated to the satisfaction of the certificating authority that the helicopter possesses, by nature of its design, adequate stability without such a system; and
- l) such additional instruments or equipment as may be prescribed by the appropriate authority.

4.10.2 All performance Class 1 and Class 2 helicopters when operated in accordance with the instrument flight rules shall be fitted with an emergency power supply, independent of the main electrical generating system, for the purpose of operating and illuminating, for a minimum period of 30 minutes, an attitude indicating instrument (artificial horizon), clearly visible to the pilot-in-command. The emergency power supply shall be automatically operative after the total failure of the main electrical generating system and clear indication shall be given on the instrument panel that the attitude indicator(s) is being operated by emergency power.

**4.11 All helicopters when operated at night**

4.11.1 All helicopters, when operated at night shall be equipped with:

- a) all equipment specified in 4.10;
- b) the lights required by Annex 2 for aircraft in flight or operating on the movement area of a heliport;

*Note.— The general characteristics of lights are specified in Annex 8. Detailed specifications for lights meeting the requirements of Annex 2 for aircraft in flight or operating on the movement area of a heliport are contained in the Airworthiness Technical Manual (Doc 9051).*

- c) two landing lights;
- d) illumination for all instruments and equipment that are essential for the safe operation of the helicopter that are used by the flight crew;
- e) lights in all passenger compartments; and
- f) an electric torch for each crew member station.

4.11.2 **Recommendation.—** One of the landing lights should be trainable, at least in the vertical plane.

**4.12 Helicopters when carrying passengers — significant-weather detection**

**Recommendation.—** Helicopters when carrying passengers should be equipped with operative weather radar or other significant-weather detection equipment whenever such helicopters are being operated in areas where thunderstorms or other potentially hazardous weather conditions, regarded as detectable, may be expected to exist along the route either at night or under instrument meteorological conditions.

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**4.13 All helicopters complying with the noise certification Standards in Annex 16, Volume I**

A helicopter shall carry a document attesting noise certification.

*Note.— The attestation may be contained in any document, carried on board, approved by the State of Registry.*

**4.14 Helicopters carrying passengers — cabin crew seats**

4.14.1 All helicopters shall be equipped with a forward or rearward facing (within 15° of the longitudinal axis of the helicopter) seat, fitted with a safety harness for the use of each cabin crew member required to satisfy the intent of 10.1 in respect of emergency evacuation.

*Note 1.— In accordance with the provisions of 4.2.2.1 c), a seat and seat belt shall be provided for the use of each additional cabin crew member.*

*Note 2.— Safety harness includes shoulder straps and a seat belt which may be used independently.*

4.14.2 Cabin crew seats shall be located near floor level and other emergency exits as required by the State of Registry for emergency evacuation.

**4.15 Helicopters required to be equipped with a pressure-altitude reporting transponder**

All helicopters shall be equipped with a pressure-altitude reporting transponder which operates in accordance with the provisions of Annex 10, Volume IV.

*Note.— This provision is intended to improve the effectiveness of air traffic services as well as airborne collision avoidance systems.*

**4.16 Microphones**

All flight crew members required to be on flight deck duty shall communicate through boom or throat microphones below the transition level/altitude.

## CHAPTER 5. HELICOPTER COMMUNICATION AND NAVIGATION EQUIPMENT

### 5.1 Communication equipment

5.1.1 A helicopter shall be provided with radio communication equipment capable of:

- a) conducting two-way communication for heliport control purposes;
- b) receiving meteorological information at any time during flight;
- c) conducting two-way communication at any time during flight with at least one aeronautical station and with such other aeronautical stations and on such frequencies as may be prescribed by the appropriate authority.

*Note.— The requirements of 5.1.1 are considered fulfilled if the ability to conduct the communications specified therein is established during radio propagation conditions which are normal for the route.*

5.1.2 The radio communication equipment required in accordance with 5.1.1 shall provide for communications on the aeronautical emergency frequency 121.5 MHz.

c) in accordance with the requirements of air traffic services;

except when, if not so precluded by the appropriate authority, navigation for flights under the visual flight rules is accomplished by visual reference to landmarks.

*Note.— Information on RNP and associated procedures is contained in the Manual on Required Navigation Performance (RNP) (Doc 9613).*

5.2.2 The helicopter shall be sufficiently provided with navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment will enable the helicopter to navigate in accordance with 5.2.1.

5.2.3 On flights in which it is intended to land in instrument meteorological conditions a helicopter shall be provided with radio equipment capable of receiving signals providing guidance to a point from which a visual landing can be effected. This equipment shall be capable of providing such guidance at each heliport at which it is intended to land in instrument meteorological conditions and at any designated alternate heliports.

### 5.2 Navigation equipment

5.2.1 A helicopter shall be provided with navigation equipment which will enable it to proceed:

- a) in accordance with its operational flight plan;
- b) in accordance with prescribed RNP types; and

### 5.3 Installation

The equipment installation shall be such that the failure of any single unit required for either communications or navigation purposes or both will not result in the failure of another unit required for communications or navigation purposes.



## CHAPTER 6. HELICOPTER MAINTENANCE

*Note on the application of this chapter.— For the purpose of this chapter "helicopter" includes: powerplants, power transmissions, rotors, components, accessories, instruments, equipment and apparatus including emergency equipment.*

### 6.1 General

6.1.1 An operator shall ensure that there is provided an organization, including trained staff, workshops and other equipment and facilities, to maintain all helicopters in an airworthy condition when in use.

6.1.2 When the performance of the maintenance required in 6.1 is assigned, either partially or wholly, to a maintenance organization approved by the State of Registry of the helicopter concerned, the operator's responsibility for compliance with Standards 6.2, 6.3 and 6.4, which follow, shall be modified according to the extent to which maintenance is assigned.

### 6.2 Maintenance manual

6.2.1 An operator shall ensure that there is provided, for the use and guidance of maintenance organizations and personnel, a maintenance manual containing the information specified in 9.2.

6.2.2 An operator shall ensure that the maintenance manual is amended or revised as is necessary to keep the information contained therein up to date.

6.2.3 Copies of all revisions and amendments of a maintenance manual shall be furnished promptly to all organizations or persons to whom the manual has been issued.

6.2.4 The design and application of the maintenance manual shall observe Human Factors principles.

*Note.— Guidance material on the application of Human Factors principles can be found in Circular 216 (Human Factors Digest No. 1 — Fundamental Human Factors Concepts), Circular 238 (Human Factors Digest No. 6 — Ergonomics) and Circular 253 (Human Factors Digest No. 12 — Human Factors in Aircraft Maintenance and Inspection).*

### 6.3 Training

An operator shall ensure that all maintenance personnel are instructed regarding the maintenance methods to be employed,

in particular when new or unfamiliar equipment is introduced into service. The training programme established by an operator for maintenance personnel shall include training in knowledge and skills related to human performance including co-ordination with other maintenance personnel and flight crew.

*Note.— Guidance material to design training programmes to develop knowledge and skills in human performance can be found in Circular 216 (Human Factors Digest No. 1 — Fundamental Human Factors Concepts); Circular 217 (Human Factors Digest No. 2 — Flight Crew Training: Cockpit Resource Management (CRM) and Line-Oriented Flight Training (LOFT)); Circular 227 (Human Factors Digest No. 3 — Training of Operational Personnel in Human Factors); and Circular 253 (Human Factors Digest No. 12 — Human Factors in Aircraft Maintenance and Inspection).*

### 6.4 Inspection

An operator shall ensure that there is provided a system of inspection to ensure that all maintenance, overhaul, modifications and repairs which affect airworthiness, are effected as prescribed in the maintenance manual.

### 6.5 Qualification to certify as airworthy

Each person charged with the responsibility of certifying as to the airworthiness of a helicopter shall be qualified in accordance with Annex 1.

### 6.6 Modifications and repairs

All modifications and repairs shall be effected in accordance with methods appropriate to the helicopter concerned.

### 6.7 Maintenance release

A maintenance release shall be completed and signed by a person or persons qualified in accordance with Annex 1 to certify that the maintenance work has been completed satisfactorily and in accordance with the methods prescribed in the maintenance manual.

**Annex 6 — Operation of Aircraft****Part III****6.8 Records**

6.8.1 An operator shall ensure that the following records are kept:

- a) in respect of the entire helicopter: the total time in service;
- b) in respect of the major components of the helicopter:
  - 1) the total time in service;
  - 2) the date of the last overhaul;
  - 3) the date of the last inspection;

c) in respect of those instruments and equipment, the serviceability and operating life of which are determined by their time in service;

- 1) such records of the time in service as are necessary to determine their serviceability or to compute their operating life;
- 2) the date of the last inspection.

6.8.2 These records shall be kept for a period of 90 days after the end of the operating life of the unit to which they refer.

## CHAPTER 7. HELICOPTER FLIGHT CREW

### 7.1 Composition of the flight crew

7.1.1 The number and composition of the flight crew shall not be less than that specified in the operations manual. The flight crews shall include flight crew members in addition to the minimum numbers specified in the flight manual or other documents associated with the certificate of airworthiness, when necessitated by considerations related to the type of helicopter used, the type of operation involved and the duration of flight between points where flight crews are changed.

7.1.2 The flight crew shall include at least one member who holds a valid licence, issued or rendered valid by the State of Registry, authorizing operation of the type of radio transmitting equipment to be used.

### 7.2 Flight crew member emergency duties

An operator shall, for each type of helicopter, assign to all flight crew members the necessary functions they are to perform in an emergency or in a situation requiring emergency evacuation. Annual training in accomplishing these functions shall be contained in the operator's training programme and shall include instruction in the use of all emergency and life-saving equipment required to be carried, and drills in the emergency evacuation of the helicopter.

### 7.3 Flight crew member training programmes

7.3.1 An operator shall establish and maintain a ground and flight training programme, approved by the State of the Operator, which ensures that all flight crew members are adequately trained to perform their assigned duties. Ground and flight training facilities and properly qualified instructors as determined by the State of the Operator shall be provided. The training programme shall consist of ground and flight training in the type(s) of helicopter on which the flight crew member serves, and shall include proper flight crew co-ordination and training in all types of emergency or abnormal situations or procedures caused by powerplant, transmission, rotor, airframe or systems malfunctions, fire or other abnormalities. The training programme shall also include training in knowledge and skills related to human performance and in the transport of dangerous goods. The training for all flight crew members, particularly that relating to abnormal or emergency procedures, shall ensure that all flight crew members know the functions for which they are responsible and the relation of these functions to the functions of other

crew members. The training programme shall be given on a recurrent basis, as determined by the State of the Operator and shall include an examination to determine competence.

*Note 1.— Paragraph 2.2.4 prohibits the in-flight simulation of emergency or abnormal situations when passengers or cargo are being carried.*

*Note 2.— Flight training may, to the extent deemed appropriate by the State of the Operator, be given in helicopter synthetic flight trainers approved by the State for that purpose.*

*Note 3.— The scope of the recurrent training required by 7.2 and 7.3 may be varied and need not be as extensive as the initial training given in a particular type of helicopter.*

*Note 4.— The use of correspondence courses and written examinations as well as other means may, to the extent deemed feasible by the State of the Operator, be utilized in meeting the requirements for periodic ground training.*

*Note 5.— Provisions for training in the transport of dangerous goods are contained in Annex 18.*

*Note 6.— Guidance material to design training programmes to develop knowledge and skills in human performance can be found in Circular 216 (Human Factors Digest No. 1 — Fundamental Human Factors Concepts); Circular 217 (Human Factors Digest No. 2 — Flight Crew Training: Cockpit Resource Management (CRM) and Line-Oriented Flight Training (LOFT)); and Circular 227 (Human Factors Digest No. 3 — Training of Operational Personnel in Human Factors).*

7.3.2 The requirement for recurrent flight training in a particular type of helicopter shall be considered fulfilled by:

- a) the use, to the extent deemed feasible by the State of the Operator, of helicopter synthetic flight trainers approved by that State for that purpose; or
- b) the completion within the appropriate period of the proficiency check required by 7.4.4 in that type of helicopter.

### 7.4 Qualifications

#### 7.4.1 Recent experience — pilot-in-command

An operator shall not assign a pilot to act as pilot-in-command of a helicopter unless, on the same type of helicopter within

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the preceding 90 days, that pilot has made at least three take-offs and landings.

**7.4.2 Recent experience — co-pilot**

An operator shall not assign a co-pilot to operate at the flight controls during take-off and landing unless, on the same type of helicopter within the preceding 90 days, that co-pilot has operated the flight controls, as pilot-in-command or as co-pilot, during three take-offs and landings or has otherwise demonstrated competence to act as co-pilot on a flight simulator approved for the purpose.

**7.4.3 Pilot-in-command route and heliport qualification**

**7.4.3.1** An operator shall not utilize a pilot as pilot-in-command of a helicopter on a route or route segment for which that pilot is not currently qualified until such pilot has complied with 7.4.3.2 and 7.4.3.3.

**7.4.3.2** Each such pilot shall demonstrate to the operator an adequate knowledge of:

- a) the route to be flown, and the heliports which are to be used. This shall include knowledge of:
  - 1) the terrain and minimum safe altitudes;
  - 2) the seasonal meteorological conditions;
  - 3) the meteorological, communication and air traffic facilities, services and procedures;
  - 4) the search and rescue procedures; and
  - 5) the navigational facilities and procedures associated with the route along which the flight is to take place; and
- b) procedures applicable to flight paths over heavily populated areas and areas of high air traffic density, obstructions, physical layout, lighting, approach aids and arrival, departure, holding and instrument approach procedures, and applicable operating minima.

*Note.— That portion of the demonstration relating to arrival, departure, holding and instrument approach procedures may be accomplished in an appropriate training device which is adequate for this purpose.*

**7.4.3.3** A pilot-in-command shall have made an actual approach into each heliport of landing on the route, accompanied by a pilot who is qualified for the heliport, as a member of the flight crew or as an observer on the flight deck, unless:

- a) the approach to the heliport is not over difficult terrain and the instrument approach procedures and aids available are similar to those with which the pilot is familiar, and a margin to be approved by the State of the Operator is added to the normal operating minima, or there is reasonable certainty that approach and landing can be made in visual meteorological conditions; or
- b) the descent from the initial approach altitude can be made by day in visual meteorological conditions; or
- c) the operator qualifies the pilot-in-command to land at the heliport concerned by means of an adequate pictorial presentation.

**7.4.3.4** The operator shall maintain a record, sufficient to satisfy the State of the Operator of the qualification of the pilot and of the manner in which such qualification has been achieved.

**7.4.3.5** An operator shall not continue to utilize a pilot as a pilot-in-command on a route unless, within the preceding 12 months, the pilot has made at least one trip between the terminal points of that route as a pilot member of the flight crew, or as a check pilot, or as an observer on the flight deck. In the event that more than 12 months elapse in which a pilot has not made such a trip on a route in close proximity and over similar terrain, prior to again serving as a pilot-in-command on that route, that pilot must requalify in accordance with 7.4.3.2 and 7.4.3.3.

**7.4.4 Pilot proficiency checks**

An operator shall ensure that piloting technique and the ability to execute emergency procedures is checked in such a way as to demonstrate the pilot's competence. Where the operation may be conducted under instrument flight rules, an operator shall ensure that the pilot's competence to comply with such rules is demonstrated to either a check pilot of the operator or to a representative of the State of the Operator. Such checks shall be performed twice within any period of one year. Any two such checks which are similar and which occur within a period of four consecutive months shall not alone satisfy this requirement.

*Note.— Flight simulators approved by the State of the Operator may be used for those parts of the checks for which they are specifically approved.*

**7.5 Flight crew equipment**

A flight crew member assessed as fit to exercise the privileges of a licence subject to the use of suitable correcting lenses, shall have a spare set of the correcting lenses readily available when exercising those privileges.

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**7.6 Flight time, flight duty periods  
and rest periods**

The State of the Operator shall establish regulations specifying the limitations applicable to the flight time and flight duty periods for flight crew members. These regulations shall also make provision for adequate rest periods and shall

be such as to ensure that fatigue occurring either in a flight or successive flights or accumulated over a period of time due to these and other tasks, does not endanger the safety of a flight.

*Note.— Guidance on the establishment of limitations is given in Attachment A.*

## CHAPTER 8. FLIGHT OPERATIONS OFFICER/FLIGHT DISPATCHER

8.1 A flight operations officer/flight dispatcher, when employed in conjunction with an approved method of flight supervision requiring the services of licensed flight operations officers/flight dispatchers shall be licensed in accordance with the provisions of Annex 1.

*Note.*— The above provisions do not necessarily require a flight operations officer/flight dispatcher to hold the licence specified in Annex 1. In accordance with 2.2 the method of flight supervision is subject to approval by the State of the Operator, which may accept proof of qualifications other than the holding of the licence.

8.2 **Recommendation.**— A flight operations officer/flight dispatcher should not be assigned to duty unless that officer has:

- a) demonstrated to the operator a knowledge of:
  - 1) the contents of the operations manual described in the Appendix;
  - 2) the radio equipment in the helicopters used; and
  - 3) the navigation equipment in the helicopters used;
- b) demonstrated to the operator a knowledge of the following details concerning operations for which the officer is responsible and areas in which that individual is authorized to exercise flight supervision:
  - 1) the seasonal meteorological conditions and the sources of meteorological information;
  - 2) the effects of meteorological conditions on radio reception in the helicopters used;

3) the peculiarities and limitations of each navigation system which is used by the operation; and

4) the helicopter loading instructions;

c) satisfied the operator as to knowledge and skills related to human performance as they apply to dispatch duties; and

d) demonstrated to the operator the ability to perform the duties specified in 2.6.

8.3 **Recommendation.**— A flight operations officer/flight dispatcher assigned to duty should maintain complete familiarization with all features of the operations which are pertinent to such duties, including knowledge and skills related to human performance.

*Note.*— Guidance material to design training programmes to develop knowledge and skills in human performance can be found in Circular 216 (Human Factors Digest No. 1 — Fundamental Human Factors Concepts); Circular 217 (Human Factors Digest No. 2 — Flight Crew Training: Cockpit Resource Management (CRM) and Line-Oriented Flight Training (LOFT)); and Circular 227 (Human Factors Digest No. 3 — Training of Operational Personnel in Human Factors).

8.4 **Recommendation.**— A flight operations officer/flight dispatcher should not be assigned to duty after 12 consecutive months of absence from such duty, unless the provisions of 8.2 are met.

## CHAPTER 9. MANUALS, LOGS AND RECORDS

### 9.1 Flight manual

*Note.— The flight manual contains the information specified in Annex 8.*

### 9.2 Maintenance manual

A maintenance manual provided in accordance with 6.2 shall contain the following information in respect of the helicopters used:

- a) procedures for servicing and maintenance;
- b) the frequency of each check, overhaul or inspection;
- c) the responsibilities of the various classes of skilled maintenance personnel;
- d) the servicing and maintenance methods which may be prescribed by, or which require the prior approval of, the State of Registry; and
- e) the procedure for preparing the maintenance release, the circumstances under which this release is to be issued and the personnel required to sign it.

### 9.3 Maintenance release

A maintenance release shall contain a certification as to the satisfactory completion of maintenance work carried out in accordance with the methods prescribed in the maintenance manual.

### 9.4 Journey log book

**9.4.1 Recommendation.—** *The helicopter journey log book should contain the following items and the corresponding roman numerals:*

- I — Helicopter nationality and registration.*
- II — Date.*
- III — Names of crew members.*
- IV — Duty assignments of crew members.*
- V — Place of departure.*

*VI — Place of arrival.*

*VII — Time of departure.*

*VIII — Time of arrival.*

*IX — Hours of flight.*

*X — Nature of flight (private, scheduled or non-scheduled).*

*XI — Incidents, observations, if any.*

*XII — Signature of person in charge.*

**9.4.2 Recommendation.—** *Entries in the journey log book should be made currently and in ink or indelible pencil.*

**9.4.3 Recommendation.—** *Completed journey log books should be retained to provide a continuous record of the last six months' operations.*

### 9.5 Records of emergency and survival equipment carried

Operators shall at all times have available for immediate communication to rescue co-ordination centres, lists containing information on the emergency and survival equipment carried on board any of their helicopters engaged in international air navigation. The information shall include, as applicable, the number, colour and type of life rafts and pyrotechnics, details of emergency medical supplies, water supplies and the type and frequencies of the emergency portable radio equipment.

*Note.— The following additional manuals and records are associated with this Annex but are not included in this chapter:*

*Fuel and oil records — see 2.2.8*

*Maintenance records — see 6.8*

*Flight time records — see 2.2.9.2*

*Flight preparation forms — see 2.3*

*Operational flight plan — see 2.3.3*

*Pilot route and heliport qualification records — see 7.4.3.4*

**9.6 Flight recorder records**

An operator shall ensure, to the extent possible, in the event the helicopter becomes involved in an accident or incident, the preservation of all related flight recorder records, and if necessary the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with Annex 13.

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## CHAPTER 10. CABIN CREW

### 10.1 Assignment of emergency duties

An operator shall establish, to the satisfaction of the State of the Operator, the minimum number of cabin crew required for each type of helicopter, based on seating capacity or the number of passengers carried, in order to effect a safe and expeditious evacuation of the helicopter, and the necessary functions to be performed in an emergency or a situation requiring emergency evacuation. The operator shall assign these functions for each type of helicopter.

### 10.2 Protection of cabin crew during flight

Each cabin crew member shall be seated with seat belt or, when provided, safety harness fastened during take-off and landing and whenever the pilot-in-command so directs.

*Note.— The foregoing does not preclude the pilot-in-command from directing the fastening of the seat belt only, at times other than during take-off and landing.*

### 10.3 Training

An operator shall establish and maintain a training programme, approved by the State of the Operator, to be completed by all persons being assigned as a cabin crew member. Cabin crew shall complete a recurrent training programme annually. These training programmes shall ensure that each person is:

- a) competent to execute those safety duties and functions that the cabin attendant is assigned to perform in the event of an emergency or in a situation requiring emergency evacuation;
- b) drilled and capable in the use of emergency and life-saving equipment required to be carried, such as life jackets, life rafts, evacuation slides, emergency exits, portable fire extinguishers, oxygen equipment and first-aid kits;

- c) when serving on helicopters operated above 3 000 m (10 000 ft), knowledgeable as regards the effect of lack of oxygen and, in the case of pressurized helicopters, as regards physiological phenomena accompanying a loss of pressurization;
- d) aware of other crew members' assignments and functions in the event of an emergency so far as is necessary for the fulfilment of the cabin crew member's own duties;
- e) aware of the types of dangerous goods which may, and may not, be carried in a passenger cabin and has completed the dangerous goods training programme required by Annex 18; and
- f) knowledgeable about human performance as related to passenger cabin safety duties and including flight crew-cabin crew co-ordination.

*Note.— Guidance material to design training programmes to develop knowledge in human performance and crew co-ordination can be found in Circular 216 (Human Factors Digest No. 1 — Fundamental Human Factors Concepts); Circular 217 (Human Factors Digest No. 2 — Flight Crew Training: Cockpit Resource Management (CRM) and Line-Oriented Flight Training (LOFT)); and Circular 227 (Human Factors Digest No. 3 — Training of Operational Personnel in Human Factors).*

### 10.4 Flight time, flight duty periods and rest periods

The State of the Operator shall establish regulations specifying the limits applicable to flight time, flight duty periods and rest periods for cabin crew.

*Note.— Guidance on the establishment of limitations is given in Attachment A.*

## CHAPTER 11. SECURITY\*

### 11.1 Helicopter search procedure checklist

An operator shall ensure that there is on board a checklist of the procedures to be followed in searching for a bomb in case of suspected sabotage. The checklist shall be supported by guidance on the course of action to be taken should a bomb or suspicious object be found.

### 11.2 Training programmes

11.2.1 An operator shall establish and maintain a training programme which enables crew members to act in the most appropriate manner to minimize the consequences of acts of unlawful interference.

11.2.2 An operator shall also establish and maintain a training programme to acquaint appropriate employees with

preventive measures and techniques in relation to passengers, baggage, cargo, mail, equipment, stores and supplies intended for carriage on a helicopter so that they contribute to the prevention of acts of sabotage or other forms of unlawful interference.

### 11.3 Reporting acts of unlawful interference

Following an act of unlawful interference the pilot-in-command shall submit, without delay, a report of such an act to the designated local authority.

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\* In the context of this Chapter, the word "security" is used in the sense of prevention of illicit acts against civil aviation.

**ANNEX 6 — PART III**

**SECTION III**  
**INTERNATIONAL GENERAL AVIATION**

**5/11/98**

## CHAPTER 1. GENERAL

*Note 1.— Although the Convention on International Civil Aviation allocates to the State of Registry certain functions which that State is entitled to discharge, or obligated to discharge, as the case may be, the Assembly recognized, in Resolution A23-13 that the State of Registry may be unable to fulfil its responsibilities adequately in instances where aircraft are leased, chartered or interchanged — in particular without crew — by an operator of another State and that the Convention may not adequately specify the rights and obligations of the State of an operator in such instances until such time as Article 83 bis of the Convention enters into force. Accordingly, the Council urged that if, in the above-mentioned instances, the State of Registry finds itself unable to discharge adequately the functions allocated to it by the Convention, it delegate to the State of the Operator, subject to acceptance by the latter State, those functions of the State of Registry that can more adequately be discharged by the State of the Operator. It was understood that pending entry into force of Article 83 bis of the Convention the foregoing action would only be a matter of practical convenience and would not affect either the provisions of the Chicago Convention prescribing the duties of the State of Registry or any third State. However, as Article 83 bis of the Convention entered into force on 20 June 1997, such transfer agreements will have effect in respect of Contracting States which have ratified the related Protocol (Doc 9318) upon fulfilment of the conditions established in Article 83 bis.*

*Note 2.— In the case of international operations effected jointly with helicopters not all of which are registered in the same Contracting State, nothing in this Part of the Annex prevents the States concerned entering into an agreement for the joint exercise of the functions placed upon the State of Registry by the provisions of the relevant Annexes.*

**1.1** The pilot-in-command shall comply with the relevant laws, regulations and procedures of the States in which the helicopter is operated.

*Note 1.— Compliance with more restrictive measures, not in contravention of the provisions of 1.1, may be required by the State of Registry.*

*Note 2.— Rules covering flight over the high seas are contained in Annex 2.*

**1.2** The pilot-in-command shall be responsible for the operation and safety of the helicopter and for the safety of all crew members, passengers and cargo on board, from the moment the engine(s) are started until the helicopter finally comes to rest at the end of the flight, with the engine(s) shut down and the rotor blades stopped.

**1.3** If an emergency situation which endangers the safety of the helicopter or persons necessitates the taking of action which involves a violation of local regulations or procedures, the pilot-in-command shall notify the appropriate local authority without delay. If required by the State in which the incident occurs, the pilot-in-command shall submit a report on any such violation to the appropriate authority of such State; in that event, the pilot-in-command shall also submit a copy of it to the State of Registry. Such reports shall be submitted as soon as possible and normally within ten days.

**1.4** The pilot-in-command shall be responsible for notifying the nearest appropriate authority by the quickest available means of any accident involving the helicopter resulting in serious injury or death of any person or substantial damage to the helicopter or property.

*Note.— A definition of the term "serious injury" is contained in Annex 13 and an explanation of the term "substantial damage" is given in the Accident/Incident Reporting Manual (ADREP Manual) (Doc 9156).*

**1.5 Recommendation.—** The pilot-in-command should have available on board the helicopter essential information concerning the search and rescue services in the areas over which it is intended the helicopter will be flown.

**1.6** Dangerous goods.

*Note 1.— Provisions for carriage of dangerous goods are contained in Annex 18.*

*Note 2.— Article 35 of the Convention refers to certain classes of cargo restrictions.*

**1.7** Use of psychoactive substances.

*Note.— Provisions concerning the use of psychoactive substances are contained in Annex 1, 1.2.7 and Annex 2, 2.5.*

## CHAPTER 2. FLIGHT OPERATIONS

### 2.1 Adequacy of operating facilities

The pilot-in-command shall not commence a flight unless it has been ascertained by every reasonable means available that the ground and/or water areas and facilities available and directly required for such flight and for the safe operation of the helicopter are adequate including communication facilities and navigation aids.

*Note.— “Reasonable means” in this Standard is intended to denote the use, at the point of departure, of information available to the pilot-in-command either through official information published by the aeronautical information services or readily obtainable from other sources.*

### 2.2 Heliport operating minima

The pilot-in-command shall not operate to or from a heliport using operating minima lower than those which may be established for that heliport by the State in which it is located, except with the specific approval of that State.

*Note.— It is the practice in some States to declare, for flight planning purposes, higher minima for a heliport when nominated as an alternate, than for the same heliport when planned as that of intended landing.*

### 2.3 Briefing

2.3.1 The pilot-in-command shall ensure that crew members and passengers are made familiar, by means of an oral briefing or by other means, with the location and the use of:

- a) seat belts; and, as appropriate,
- b) emergency exits;
- c) life jackets;
- d) oxygen dispensing equipment; and
- e) other emergency equipment provided for individual use, including passenger emergency briefing cards.

2.3.2 The pilot-in-command shall ensure that all persons on board are aware of the location and general manner of use of the principal emergency equipment carried for collective use.

### 2.4 Helicopter airworthiness and safety precautions

A flight shall not be commenced until the pilot-in-command is satisfied that:

- a) the helicopter is airworthy, duly registered and that appropriate certificates with respect thereto are aboard the helicopter;
- b) the instruments and equipment installed in the helicopter are appropriate, taking into account the expected flight conditions;
- c) any necessary maintenance has been performed in accordance with Chapter 6;
- d) the mass of the helicopter and centre of gravity location are such that the flight can be conducted safely, taking into account the flight conditions expected;
- e) any load carried is properly distributed and safely secured; and
- f) the helicopter operating limitations, contained in the flight manual, or its equivalent, will not be exceeded.

### 2.5 Weather reports and forecasts

Before commencing a flight the pilot-in-command shall be familiar with all available meteorological information appropriate to the intended flight. Preparation for a flight away from the vicinity of the place of departure, and for every flight under the instrument flight rules, shall include: 1) a study of available current weather reports and forecasts; and 2) the planning of an alternative course of action to provide for the eventuality that the flight cannot be completed as planned, because of weather conditions.

*Note.— The requirements for flight plans are contained in Annex 2 — Rules of the Air; and Procedures for Air Navigation Services — Rules of the Air and Air Traffic Services (PANS-RAC) (Doc 4444).*

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## Annex 6 — Operation of Aircraft

## 2.6 Limitations imposed by weather conditions

## 2.6.1 Flight in accordance with the visual flight rules

A flight, except one of purely local character in visual meteorological conditions, to be conducted in accordance with the visual flight rules shall not be commenced unless available current meteorological reports, or a combination of current reports and forecasts, indicate that the meteorological conditions along the route, or that part of the route to be flown under the visual flight rules, will, at the appropriate time, be such as to render compliance with these rules possible.

## 2.6.2 Flight in accordance with the instrument flight rules

2.6.2.1 *When an alternate is required.* A flight to be conducted in accordance with the instrument flight rules shall not be commenced unless the available information indicates that conditions, at the heliport of intended landing and at least one alternate heliport will, at the estimated time of arrival, be at or above the heliport operating minima.

*Note.— It is the practice in some States to declare, for flight planning purposes, higher minima for a heliport when nominated as an alternate than for the same heliport when planned as that of intended landing.*

2.6.2.2 *When no alternate is required.* A flight to be conducted in accordance with the instrument flight rules to a heliport when no alternate heliport is required shall not be commenced unless available current meteorological information indicates that the following meteorological conditions will exist from two hours before to two hours after the estimated time of arrival: or from the actual time of departure to two hours after the estimated time of arrival, whichever is the shorter period:

- a) a cloud base of at least 120 m (400 ft) above the minimum associated with the instrument approach procedure; and
- b) visibility of at least 1.5 km more than the minimum associated with the procedure.

*Note.— These should be considered as minimum values where a reliable and continuous meteorological watch is maintained. When only an "area" type forecast is available these values should be increased accordingly.*

## 2.6.3 Heliport operating minima

2.6.3.1 A flight shall not be continued towards the heliport of intended landing unless the latest available meteorological information indicates that conditions at that

heliport, or at least one alternate heliport, will, at the estimated time of arrival, be at or above the specified heliport operating minima.

2.6.3.2 An instrument approach shall not be continued beyond the outer marker fix in case of precision approach, or below 300 m (1 000 ft) above the heliport in case of non-precision approach, unless the reported visibility or controlling RVR is above the specified minimum.

2.6.3.3 If, after passing the outer marker fix in case of precision approach, or after descending below 300 m (1 000 ft) above the heliport in case of non-precision approach, the reported visibility or controlling RVR falls below the specified minimum, the approach may be continued to DA/H or MDA/H. In any case, a helicopter shall not continue its approach-to-land beyond a point at which the limits of the heliport operating minima would be infringed.

## 2.6.4 Flight in icing conditions

A flight to be operated in known or expected icing conditions shall not be commenced unless the helicopter is certificated and equipped to cope with such conditions.

## 2.7 Alternate heliports

2.7.1 For a flight to be conducted in accordance with the instrument flight rules, at least one suitable alternate shall be specified in the operational flight plan and the flight plan, unless:

- a) the weather conditions in 2.6.2.2 prevail, or
- b) 1) the heliport of intended landing is isolated and no suitable alternate is available; and
- 2) an instrument approach procedure is prescribed for the isolated heliport of intended landing; and
- 3) a point of no return (PNR) is determined in case of an off-shore destination.

2.7.2 Suitable off-shore alternates may be specified subject to the following:

- the off-shore alternates shall be used only after passing a point of no return (PNR). Prior to PNR on-shore alternates shall be used;
- mechanical reliability of critical control systems and critical components shall be considered and taken into account when determining the suitability of the alternate;

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## Part III

- one engine inoperative performance capability shall be attainable prior to arrival at the alternate;
- deck availability shall be guaranteed;
- weather information must be reliable and accurate.

*Note.— The landing technique specified in the flight manual following control system failure may preclude the nomination of certain helidecks as alternate heliports.*

**2.7.3 Recommendation.—** *Off-shore alternates should not be used when it is possible to carry enough fuel to have an on-shore alternate. Such circumstances should be exceptions and should not include payload enhancement in adverse weather conditions.*

**2.8 Fuel and oil supply**

**2.8.1 All helicopters.** A flight shall not be commenced unless, taking into account both the meteorological conditions and any delays that are expected in flight, the helicopter carries sufficient fuel and oil to ensure that it can safely complete the flight. In addition, a reserve shall be carried to provide for contingencies.

**2.8.2 Visual flight rules (VFR) operations.** The fuel and oil carried in order to comply with 2.8.1 shall, in the case of VFR operations, be at least the amount sufficient to allow the helicopter:

- a) to fly to the heliport to which the flight is planned;
- b) to fly thereafter for a period of 20 minutes at best-range speed plus 10 per cent of the planned flight time; and
- c) to have an additional amount of fuel, sufficient to provide for the increased consumption on the occurrence of potential contingencies, as determined by the State and specified in the State regulations governing general aviation.

**2.8.3 Instrument flight rules (IFR) operations.** The fuel and oil carried in order to comply with 2.8.1 shall, in the case of IFR operations, be at least the amount sufficient to allow the helicopter:

**2.8.3.1** When no alternate is required, in terms of 2.6.2.2, to fly to the heliport to which the flight is planned, and thereafter:

- a) to fly 30 minutes at holding speed at 450 m (1 500 ft) above the destination heliport under standard temperature conditions and approach and land; and
- b) to have an additional amount of fuel, sufficient to provide for the increased consumption on the occurrence of potential contingencies.

**2.8.3.2** When an alternate is required, in terms of 2.6.2.1, to fly to and execute an approach, and a missed approach, at the heliport to which the flight is planned, and thereafter:

- a) to fly to the alternate specified in the flight plan; and then
- b) to fly for 30 minutes at holding speed at 450 m (1 500 ft) above the alternate under standard temperature conditions, and approach and land; and
- c) to have an additional amount of fuel sufficient to provide for the increased consumption on the occurrence of potential contingencies.

**2.8.3.3** When no suitable alternate is available, in terms of 2.7.1 b), to fly to the heliport to which the flight is planned and thereafter for a period of two hours at holding speed.

**2.8.4** In computing the fuel and oil required in 2.8.1, at least the following shall be considered:

- a) meteorological conditions forecast;
- b) expected air traffic control routings and traffic delays;
- c) for IFR flight, one instrument approach at the destination heliport, including a missed approach;
- d) the procedures for loss of pressurization, where applicable, or failure of one power-unit while en route; and
- e) any other conditions that may delay the landing of the helicopter or increase fuel and/or oil consumption.

*Note.— Nothing in 2.8 precludes amendment of a flight plan in flight in order to re-plan the flight to another heliport, provided that the requirements of 2.8 can be complied with from the point where the flight has been replanned.*

**2.9 Oxygen supply**

*Note.— Approximate altitudes in the Standard Atmosphere corresponding to the values of absolute pressure used in the text are as follows:*

Absolute pressure	Metres	Feet
700 hPa	3 000	10 000
620 hPa	4 000	13 000

**2.9.1** A flight to be operated at altitudes at which the atmospheric pressure in personnel compartments will be less than 700 hPa shall not be commenced unless sufficient stored breathing oxygen is carried to supply:

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a) all crew members and 10 per cent of the passengers for any period in excess of 30 minutes that the pressure in compartments occupied by them will be between 700 hPa and 620 hPa;

b) the crew and passengers for any period that the atmospheric pressure in compartments occupied by them will be less than 620 hPa.

2.9.2 A flight to be operated with a pressurized helicopter shall not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all the crew members and a proportion of the passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurization, for any period that the atmospheric pressure in any compartment occupied by them would be less than 700 hPa.

**2.10 Use of oxygen**

All flight crew members, when engaged in performing duties essential to the safe operation of a helicopter in flight, shall use breathing oxygen continuously whenever the circumstances prevail for which its supply has been required in 2.9.1 or 2.9.2.

**2.11 In-flight emergency instruction**

In an emergency during flight, the pilot-in-command shall ensure that all persons on board are instructed in such emergency action as may be appropriate to the circumstances.

**2.12 Weather reporting by pilots**

**Recommendation.**— *When weather conditions likely to affect the safety of other aircraft are encountered, they should be reported as soon as possible.*

**2.13 Hazardous flight conditions**

**Recommendation.**— *Hazardous flight conditions, other than those associated with meteorological conditions, encountered en route should be reported as soon as possible. The reports so rendered should give such details as may be pertinent to the safety of other aircraft.*

**2.14 Fitness of flight crew members**

The pilot-in-command shall be responsible for ensuring that a flight:

a) will not be commenced if any flight crew member is incapacitated from performing duties by any cause such as injury, sickness, fatigue, the effects of alcohol or drugs; and

b) will not be continued beyond the nearest suitable heliport when flight crew members' capacity to perform functions is significantly reduced by impairment of faculties from causes such as fatigue, sickness, lack of oxygen.

**2.15 Flight crew members at duty stations****2.15.1 Take-off and landing**

All flight crew members required to be on flight deck duty shall be at their stations.

**2.15.2 En route**

All flight crew members required to be on flight deck duty shall remain at their stations except when their absence is necessary for the performance of duties in connection with the operation of the helicopter, or for physiological needs.

**2.15.3 Seat belts**

All flight crew members shall keep their seat belt fastened when at their stations.

**2.15.4 Safety harness**

**Recommendation.**— *When safety harnesses are provided, any flight crew member occupying a pilot's seat should keep the safety harness fastened during the take-off and landing phases; all other flight crew members should keep their safety harness fastened during the take-off and landing phases unless the shoulder straps interfere with the performance of their duties, in which case the shoulder straps may be unfastened but the seat belt must remain fastened.*

**Note.**— *Safety harness includes shoulder strap(s) and a seat belt which may be used independently.*

**2.16 Instrument flight procedures**

2.16.1 One or more instrument approach procedures shall be approved and promulgated by the State in which the heliport is located, or by the State which is responsible for the



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heliport when located outside the territory of any State, to serve each final approach and take-off area or heliport utilized for instrument flight operations.

2.16.2 All helicopters operated in accordance with instrument flight rules shall comply with the instrument approach procedures approved by the State in which the heliport is located, or by the State which is responsible for the heliport when located outside the territory of any State.

*Note 1.— Operational procedures recommended for the guidance of operations personnel involved in instrument flight operations are described in PANS-OPS (Doc 8168), Volume I.*

*Note 2.— Criteria for the construction of instrument flight procedures for the guidance of procedure specialists are provided in PANS-OPS (Doc 8168), Volume II.*

**2.17 Instruction — general**

A helicopter rotor shall not be turned under power without a qualified pilot at the controls.

**2.18 Refuelling with passengers on board or rotors turning**

2.18.1 **Recommendation.**— *A helicopter should not be refuelled when passengers are embarking, on board or*

*disembarking or when the rotor is turning unless it is attended by the pilot-in-command or other qualified personnel ready to initiate and direct an evacuation of the helicopter by the most practical and expeditious means available.*

2.18.2 **Recommendation.**— *When refuelling with passengers embarking, on board or disembarking, two-way communications should be maintained by helicopter inter-communications system or other suitable means between the ground crew supervising the refuelling and the pilot-in-command or other qualified personnel required by 2.18.1.*

*Note 1.— Provisions concerning aircraft refuelling are contained in Annex 14, Volume I, and guidance on safe refuelling practices is contained in the Airport Services Manual (Doc 9137), Parts 1 and 8.*

*Note 2.— Additional precautions are required when refuelling with fuels other than aviation kerosene or when refuelling results in a mixture of aviation kerosene with other aviation turbine fuels, or when an open line is used.*

**2.19 Over-water flights**

All helicopters on flights over water in accordance with 4.3.1 shall be certificated for ditching. Sea state shall be an integral part of ditching information.

### CHAPTER 3. HELICOPTER PERFORMANCE OPERATING LIMITATIONS

3.1 A helicopter shall be operated:

- a) in compliance with the terms of its airworthiness certificate or equivalent approved document;
- b) within the operating limitations prescribed by the certifying authority of the State of Registry; and
- c) within the mass limitations imposed by compliance with the applicable noise certification Standards in Annex 16, Volume I, unless otherwise authorized, in exceptional circumstances for a certain heliport where there is no noise disturbance problem, by the competent authority of the State in which the heliport is situated.

3.2 Placards, listings, instrument markings, or combinations thereof, containing those operating limitations

prescribed by the certifying authority of the State of Registry for visual presentation, shall be displayed in the helicopter.

*Note.— The Standards of Annex 8 — Airworthiness of Aircraft, Part IV, apply to all helicopters intended for the carriage of passengers or cargo or mail in international air navigation.*

3.3 Only performance Class 1 helicopters shall be permitted to operate from elevated heliports in congested areas.

3.4 **Recommendation.**— *Performance Class 3 helicopters should not be permitted to operate from elevated heliports or helidecks.*

## CHAPTER 4. HELICOPTER INSTRUMENTS, EQUIPMENT, AND FLIGHT DOCUMENTS

*Note.— Specifications for the provision of helicopter communication and navigation equipment are contained in Chapter 5.*

### 4.1 All helicopters on all flights

#### 4.1.1 General

In addition to the minimum equipment necessary for the issuance of a certificate of airworthiness, the instruments, equipment and flight documents prescribed in the following paragraphs shall be installed or carried, as appropriate, in helicopters according to the helicopter used and to the circumstances under which the flight is to be conducted.

#### 4.1.2 Instruments

A helicopter shall be equipped with instruments which will enable the flight crew to control the flight path of the helicopter, carry out any required procedural manoeuvre, and observe the operating limitations of the helicopter in the expected operating conditions.

#### 4.1.3 Equipment

4.1.3.1 All helicopters on all flights shall be equipped with:

- a) an accessible first-aid kit;
- b) portable fire extinguishers of a type which, when discharged, will not cause dangerous contamination of the air within the helicopter. At least one shall be located in:
  - 1) the pilot's compartment; and
  - 2) each passenger compartment that is separate from the pilot's compartment and not readily accessible to the pilot or co-pilot;
- c) 1) a seat or berth for each person over an age to be determined by the State of Registry; and

- 2) a seat belt for each seat and restraining belts for each berth;

d) the following manuals, charts and information:

- 1) the flight manual or other documents or information concerning any operating limitations prescribed for the helicopter by the certificating authority of the State of Registry, required for the application of Chapter 3;
  - 2) current and suitable charts for the route of the proposed flight and all routes along which it is reasonable to expect that the flight may be diverted;
  - 3) procedures, as prescribed in Annex 2, for pilots-in-command of intercepted aircraft; and
  - 4) a list of visual signals for use by intercepting and intercepted aircraft, as contained in Annex 2; and
- e) spare electrical fuses of appropriate ratings for replacement of those accessible in flight.

4.1.3.2 **Recommendation.**— *All helicopters on all flights should be equipped with the ground-air signal codes for search and rescue purposes.*

4.1.3.3 **Recommendation.**— *All helicopters on all flights should be equipped with a safety harness for each flight crew member seat.*

*Note.— Safety harness includes shoulder strap(s) and a seat belt which may be used independently.*

#### 4.1.4 Marking of break-in points

4.1.4.1 If areas of the fuselage suitable for break-in by rescue crews in an emergency are marked on a helicopter, such areas shall be marked as shown below (see figure following). The colour of the markings shall be red or yellow, and if necessary they shall be outlined in white to contrast with the background.

4.1.4.2 If the corner markings are more than 2 m apart, intermediate lines 9 cm x 3 cm shall be inserted so that there is no more than 2 m between adjacent markings.

*Note.— This Standard does not require any helicopter to have break-in areas.*

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**4.2 All helicopters operated as VFR flights**

4.2.1 All helicopters when operated as VFR flights shall be equipped with:

- a) a magnetic compass;
- b) an accurate timepiece indicating the time in hours, minutes and seconds;
- c) a sensitive pressure altimeter;
- d) an airspeed indicator; and
- e) such additional instruments or equipment as may be prescribed by the appropriate authority.

4.2.2 **Recommendation.**— *VFR flights which are operated as controlled flights shall be equipped in accordance with 4.6.*

**4.3 All helicopters on flights over water****4.3.1 Means of floatation**

All helicopters intended to be flown over water shall be fitted with a permanent or rapidly deployable means of floatation so as to ensure a safe ditching of the helicopter when:

- a) flying over water at a distance from land corresponding to more than 10 minutes at normal cruise speed in the case of performance Class 1 or 2 helicopters; or

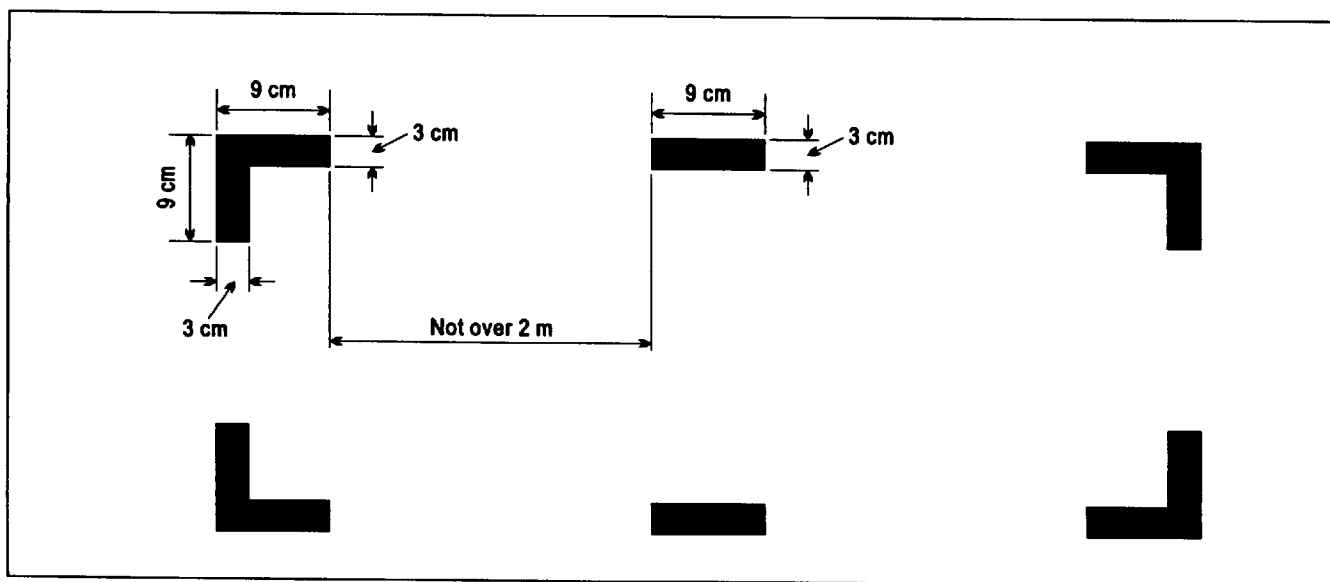
- b) flying over water beyond autorotational or safe forced landing distance from land in the case of performance Class 3 helicopters.

**4.3.2 Emergency equipment**

4.3.2.1 Performance Class 1 and 2 helicopters operating in accordance with the provisions of 4.3.1, shall be equipped with:

- a) one life jacket, or equivalent individual floatation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided;
- b) life-saving rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency, provided with such life-saving equipment including means of sustaining life as is appropriate to the flight to be undertaken; and
- c) equipment for making the pyrotechnical distress signals described in Annex 2.

4.3.2.2 Performance Class 3 helicopters when operating beyond autorotational distance from land but within a distance from land specified by the appropriate authority of the responsible State shall be equipped with one life jacket, or equivalent individual floatation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided.



MARKING OF BREAK-IN POINTS (see 4.1.4)

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*Note.— When determining the distance from land referred to in 4.3.2.2, consideration should be given to environmental conditions and the availability of SAR facilities.*

4.3.2.3 Performance Class 3 helicopters when operating outside the provisions of 4.3.2.2 shall be equipped as in 4.3.2.1.

4.3.2.4 In the case of performance Class 2 and Class 3 helicopters, when taking off or landing at a heliport where the take-off or approach path is so disposed over water that in the event of a mishap there would be likelihood of a ditching, at least the equipment required in 4.3.2.1 a) shall be carried.

4.3.2.5 Each life jacket and equivalent individual floatation device, when carried in accordance with this 4.3, shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons.

4.3.2.6 **Recommendation.**— *On any helicopter for which the individual certificate of airworthiness is first issued on or after 1 January 1991, at least 50 per cent of the life rafts carried in accordance with the provisions of 4.3.2 should be deployable by remote control.*

4.3.2.7 **Recommendation.**— *Rafts which are not deployable by remote control and which have a mass of more than 40 kg should be equipped with some means of mechanically assisted deployment.*

4.3.2.8 **Recommendation.**— *On any helicopter for which the individual certificate of airworthiness was first issued before 1 January 1991, the provisions of 4.3.2.6 and 4.3.2.7 should be complied with no later than 31 December 1992.*

#### **4.4 All helicopters on flights over designated land areas**

Helicopters, when operated across land areas which have been designated by the State concerned as areas in which search and rescue would be especially difficult, shall be equipped with such signalling devices and life-saving equipment (including means of sustaining life) as may be appropriate to the area overflown.

#### **4.5 All helicopters on high altitude flights**

##### **4.5.1 Unpressurized helicopters**

Unpressurized helicopters intended to be operated at high altitudes shall carry equipment for storing and dispensing the oxygen supplies required in 2.9.1.

##### **4.5.2 Pressurized helicopters**

**Recommendation.**— *Pressurized helicopters intended to be operated at high altitudes should carry emergency oxygen storage and dispensing equipment capable of storing and dispensing the oxygen supplies required in 2.9.2.*

#### **4.6 All helicopters operated in accordance with the instrument flight rules**

All helicopters, when operated in accordance with the instrument flight rules or when the helicopter cannot be maintained in a desired attitude without reference to one or more flight instruments, shall be equipped with:

- a) a magnetic compass;
  - b) an accurate timepiece indicating the time in hours, minutes and seconds;
  - c) a sensitive pressure altimeter;
- Note.— Due to the long history of misreadings, the use of drum-pointer altimeters is not recommended.*
- d) an airspeed indicating system with a means of preventing malfunctioning due to either condensation or icing;
  - e) a slip indicator;
  - f) two attitude indicators (artificial horizon), one of which may be replaced by a turn indicator;
  - g) a heading indicator (directional gyroscope);

*Note.— The requirements of e), f) and g) above, may be met by combinations of instruments or by integrated flight director systems provided that the safeguards against total failure, inherent in the separate instruments, are retained.*

- h) means of indicating whether the supply of power to the gyroscopic instruments is adequate;
- i) a means of indicating in the flight crew compartment the outside air temperature;
- j) a rate-of-climb and descent indicator; and
- k) such additional instruments or equipment as may be prescribed by the appropriate authority.

#### **4.7 All helicopters when operated at night**

4.7.1 All helicopters, when operated at night, shall be equipped with:

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- a) all the equipment specified in 4.6;
- b) the lights required by Annex 2 for aircraft in flight or operating on the movement area of a heliport;

*Note.— The general characteristics of lights are specified in Annex 8. Detailed specifications for lights meeting the requirements of Annex 2 for aircraft in flight or operating on the movement area of a heliport are contained in the Airworthiness Technical Manual (Doc 9051).*

- c) a landing light;
- d) illumination for all flight instruments and equipment that are essential for the safe operation of the helicopter;
- e) lights in all passenger compartments; and
- f) an electric torch for each crew member station.

**4.7.2 Recommendation.—** *The landing light should be trainable, at least in the vertical plane.*

#### 4.8 All helicopters complying with the noise certification Standards in Annex 16, Volume I

A helicopter shall carry a document attesting noise certification.

*Note.— The attestation may be contained in any document, carried on board, approved by the State of Registry.*

#### 4.9 Flight recorders

*Note 1.— Flight recorders comprise two systems — a flight data recorder and a cockpit voice recorder.*

*Note 2.— Combination recorders (FDR/CVR) can only be used to meet the flight recorder equipage requirements as specifically indicated in this Annex.*

*Note 3.— Detailed guidance on flight recorders is contained in Attachment B.*

##### 4.9.1 Flight data recorders — types

**4.9.1.1** A Type IV flight data recorder shall record the parameters required to determine accurately the helicopter flight path, speed, attitude, engine power and operation.

**4.9.1.2** A Type V flight data recorder shall record the parameters required to determine accurately the helicopter flight path, speed, attitude and engine power.

**4.9.1.3** The use of engraving metal foil flight data recorders shall be discontinued by 1 January 1995.

**4.9.1.4 Recommendation.—** *The use of photographic film data recorders and analogue data recorders using frequency modulation (FM) should be discontinued by 5 November 1998.*

**4.9.1.5** From 1 January 2005, all helicopters equipped to utilize digital communications and required to carry a cockpit voice recorder shall record on the cockpit voice recorder or the flight data recorder the digital communications messages with ATS.

**4.9.1.5.1** If recorded on the flight data recorder, the digital communications shall be readily correlatable to the cockpit voice recording.

**4.9.1.6 Recommendation.—** *All helicopters of a maximum certificated take-off mass over 2 700 kg, required to be equipped with a flight data recorder and/or a cockpit voice recorder, may alternatively be equipped with one combination recorder (FDR/CVR).*

##### 4.9.2 Flight data recorders — duration

Types IV and V flight data recorders shall be capable of retaining the information recorded during at least the last ten hours of their operation.

**4.9.3 Flight data recorders — helicopters**  
for which the individual certificate of airworthiness is first issued on or after 1 January 1989

**4.9.3.1** All helicopters of a maximum certificated take-off mass of over 7 000 kg shall be equipped with a Type IV flight data recorder.

**4.9.3.2 Recommendation.—** *All helicopters of a maximum certificated take-off mass of over 2 700 kg up to and including 7 000 kg should be equipped with a Type V flight data recorder.*

**4.9.4 Cockpit voice recorders — helicopters**  
for which the individual certificate of airworthiness is first issued on or after 1 January 1987

**4.9.4.1** All helicopters of a maximum certificated take-off mass of over 7 000 kg shall be equipped with a cockpit voice recorder the objective of which is the recording of the aural environment on the flight deck during flight time. For helicopters not equipped with a flight data recorder, at least main rotor speed shall be recorded on one track of the cockpit voice recorder.

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**4.9.4.2 Recommendation.**— All helicopters of a maximum certificated take-off mass of over 2 700 kg, up to and including 7 000 kg, should be equipped with a cockpit voice recorder, the objective of which is the recording of the aural environment on the flight deck during flight time. For helicopters not equipped with a flight data recorder, at least main rotor speed should be recorded on one track of the cockpit voice recorder.

## 4.9.5 Cockpit voice recorders — duration

**4.9.5.1** A cockpit voice recorder shall be capable of retaining the information recorded during at least the last 30 minutes of its operation.

**4.9.5.2 Recommendation.**— A cockpit voice recorder, installed in helicopters for which the individual certificate of airworthiness is first issued on or after 1 January 1990, should be capable of retaining the information recorded during at least the last two hours of its operation.

## 4.9.6 Flight recorders — construction and installation

Flight recorders shall be constructed, located and installed so as to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed.

## 4.9.7 Flight recorders — operation

**4.9.7.1** Flight recorders shall not be switched off during flight time.

**4.9.7.2** To preserve flight recorder records, flight recorders shall be de-activated upon completion of flight time following an accident or incident. The flight recorders shall not be re-activated before their disposition as determined in accordance with Annex 13.

*Note 1.*— The need for removal of the flight recorder records from the aircraft is to be determined by the investigation authority in the State conducting the investigation with due regard to the seriousness of an occurrence and the circumstances, including the impact on the operation.

*Note 2.*— The operator's responsibilities regarding the retention of flight recorder records are contained in 9.6.

## 4.9.8 Flight recorders — continued serviceability

Operational checks and evaluations of recordings from the flight data and cockpit voice recorder systems shall be conducted to ensure the continued serviceability of the recorders.

*Note.*— Procedures for the inspections of the flight data and cockpit voice recorder systems are given in Attachment B.

## 4.10 Emergency locator transmitter (ELT)

**4.10.1** Except as provided for in 4.10.2, until 1 January 2005 all Performance Class 1 and 2 helicopters operating on flights over water as described in 4.3.1 a) and Performance Class 3 helicopters operating as described in 4.3.1 b) shall be equipped with at least one ELT(S) per raft carried but not more than a total of two ELTs are required.

**4.10.2** Performance Class 1 and 2 helicopters for which the individual certificate of airworthiness is first issued after 1 January 2002, operating on flights over water as described in 4.3.1 a) and Performance Class 3 helicopters for which the individual certificate of airworthiness is first issued after 1 January 2002, operating as described in 4.3.1 b) shall be equipped with at least one automatic ELT and one ELT(S) in a raft.

**4.10.3** From 1 January 2005, all Performance Class 1 and 2 helicopters operating on flights over water as described in 4.3.1 a) and Performance Class 3 helicopters operating as described in 4.3.1 b) shall be equipped with at least one automatic ELT and one ELT(S) in a raft.

**4.10.4** Except as provided for in 4.10.5, until 1 January 2005 helicopters on flights over designated land areas as described in 4.4. shall be equipped with at least one ELT.

**4.10.5** Helicopters for which the individual certificate of airworthiness is first issued after 1 January 2002, on flights over designated land areas as described in 4.4 shall be equipped with at least one automatic ELT.

**4.10.6** From 1 January 2005, helicopters on flights over designated land areas as described in 4.4 shall be equipped with at least one automatic ELT.

**4.10.7 Recommendation.**— All helicopters should carry an automatic ELT.

**4.10.8** ELT equipment carried to satisfy the requirements of 4.10.1, 4.10.2, 4.10.3, 4.10.4, 4.10.5, 4.10.6 and 4.10.7 shall operate in accordance with the relevant provisions of Annex 10, Volume III.

## 4.11 Helicopters required to be equipped with a pressure-altitude reporting transponder

**4.11.1** From 1 January 2003, unless exempted by the appropriate authorities, all helicopters shall be equipped with a pressure-altitude reporting transponder which operates in accordance with the relevant provisions of Annex 10, Volume IV.

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**4.11.2 Recommendation.**— All helicopters should be equipped with a pressure-altitude reporting transponder which operates in accordance with the relevant provisions of Annex 10, Volume IV.

*Note.*— The provisions in 4.11.1 and 4.11.2 are intended to support the effectiveness of ACAS as well as to improve effectiveness of air traffic services. Effective dates for carriage requirements of ACAS are contained in Annex 6, Part I, 6.18.1 and 6.18.2. The intent is also for aircraft not equipped with pressure-altitude reporting transponders to be operated so as not to share airspace used by aircraft equipped with airborne

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collision avoidance systems. To this end, exemptions from the carriage requirement for pressure-altitude reporting transponders could be given by designating airspace where such carriage is not required.

**4.12 Microphones**

**Recommendation.**— All flight crew members required to be on flight deck duty should communicate through boom or throat microphones below the transition level/altitude.



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## CHAPTER 5. HELICOPTER COMMUNICATION AND NAVIGATION EQUIPMENT

### 5.1 Communication equipment

5.1.1 A helicopter to be operated in accordance with the instrument flight rules or at night shall be provided with radio communication equipment. Such equipment shall be capable of conducting two-way communication with those aeronautical stations and on those frequencies prescribed by the appropriate authority.

*Note.— The requirements of 5.1.1 are considered fulfilled if the ability to conduct the communications specified therein is established during radio propagation conditions which are normal for the route.*

5.1.2 When compliance with 5.1.1 requires that more than one communication equipment unit be provided, each shall be independent of the other or others to the extent that a failure in any one will not result in failure of any other.

5.1.3 A helicopter to be operated in accordance with the visual flight rules, but as a controlled flight, shall, unless exempted by the appropriate authority, be provided with radio communication equipment capable of conducting two-way communication at any time during flight with such aeronautical stations and on such frequencies as may be prescribed by the appropriate authority.

5.1.4 A helicopter to be operated on a flight to which the provisions of 4.3 or 4.4 apply shall, unless exempted by the appropriate authority, be provided with radio communication equipment capable of conducting two-way communication at any time during flight with such aeronautical stations and on such frequencies as may be prescribed by the appropriate authority.

5.1.5 **Recommendation.—** *The radio communication equipment required in accordance with 5.1.1 to 5.1.4 should provide for communication on the aeronautical emergency frequency 121.5 MHz.*

### 5.2 Navigation equipment

5.2.1 A helicopter shall be provided with navigation equipment which will enable it to proceed:

- a) in accordance with its flight plan;
- b) in accordance with prescribed RNP types; and
- c) in accordance with the requirements of air traffic services;

except when, if not so precluded by the appropriate authority, navigation for flights under the visual flight rules is accomplished by visual reference to landmarks. For international general aviation, landmarks shall be located at least every 110 km (60 NM).

*Note.— Information on RNP and associated procedures is contained in the Manual on Required Navigation Performance (RNP) (Doc 9613).*

5.2.2 The helicopter shall be sufficiently provided with navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment will enable the helicopter to navigate in accordance with 5.2.1.

*Note.— For international general aviation, this requirement may be met by means other than the duplication of equipment.*

5.2.3 On flights in which it is intended to land in instrument meteorological conditions a helicopter shall be provided with radio equipment capable of receiving signals providing guidance to a point from which a visual landing can be effected. This equipment shall be capable of providing such guidance at each heliport at which it is intended to land in instrument meteorological conditions and at any designated alternate heliports.

## CHAPTER 6. HELICOPTER MAINTENANCE

*Note on the application of this chapter.— For the purpose of this chapter “helicopter” includes: powerplants, power transmissions, rotors, components, accessories, instruments, equipment and apparatus including emergency equipment.*

### 6.1 Responsibility

6.1.1 The owner of a helicopter, or in the case where it is leased, the lessee, shall be responsible for its maintenance in an airworthy condition when in use.

6.1.2 The owner of a helicopter, or in the case where it is leased, the lessee, shall be responsible for ensuring, in so far as practicable, that:

- a) all maintenance, overhaul, alterations and repairs which affect airworthiness, are performed as prescribed by the State of Registry;
- b) maintenance personnel make appropriate entries in the helicopter maintenance records certifying that the helicopter is airworthy;
- c) the maintenance release is completed and signed by a person or persons qualified in accordance with the provisions of Annex 1 to certify that the maintenance work has been completed satisfactorily and in accordance with the prescribed methods.

### 6.2 Qualification to certify as airworthy

Each person charged with the responsibility of certifying as to the airworthiness of a helicopter shall be qualified in accordance with the provisions of Annex 1.

### 6.3 Maintenance records

6.3.1 The owner of a helicopter shall keep a maintenance record of the following:

- a) In respect of the entire helicopter:
  - 1) the current empty mass and the location of the centre of gravity when empty;
  - 2) the addition or removal of equipment;
  - 3) the kind and extent of the maintenance and alteration and the time in service and date when the work was performed;
  - 4) chronological list of compliance with airworthiness directives and the methods of compliance.
- b) In respect of the major components:
  - 1) the total time in service;
  - 2) the date of the last overhaul;
  - 3) the time in service since the last overhaul;
  - 4) the date of the last inspection.
- c) In respect of those instruments and equipment, the serviceability and operating life of which are determined by their time in service:
  - 1) such records of the time in service as are necessary to determine their serviceability or to compute their operating life;
  - 2) the date of the last inspection.

6.3.2 The records referred to in 6.3.1 shall be kept for a period of 90 days after the end of the operating life of the unit to which they refer.

6.3.3 The lessee of a helicopter shall comply with the requirements of 6.3.1 and 6.3.2, as applicable, while the helicopter is leased.

*Note.— Maintenance records or related documents, other than a valid certificate of airworthiness, need not be carried in the helicopter during international flights.*

## **CHAPTER 7. HELICOPTER FLIGHT CREW**

### **7.1 Qualifications**

The pilot-in-command shall ensure that the licences of each flight crew member have been issued or rendered valid by the State of Registry, and are properly rated and of current validity, and shall be satisfied that flight crew members have maintained competence.

### **7.2 Composition of the flight crew**

The number and composition of the flight crew shall not be less than that specified in the flight manual or other documents associated with the certificate of airworthiness.

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## **ANNEX 6 — PART III**

### **APPENDIX**

**5/11/98**

## APPENDIX. CONTENTS OF AN OPERATIONS MANUAL

(See Section II, 2.2.2.1)

An operations manual, which may be issued in separate parts corresponding to specific aspects of operations, provided in accordance with Section II, Chapter 2, 2.2.2.1 shall contain at least the following:

### 1. Operations administration and supervision

1.1 Instructions outlining the responsibilities of operations personnel pertaining to the conduct of flight operations.

1.2 Checklist of emergency and safety equipment and instructions for its use.

1.3 The minimum equipment list for the helicopter types operated and specific operations authorized.

1.4 Safety precautions during refuelling with passengers on board.

### 2. Accident prevention and flight safety programme

Details of the accident prevention and flight safety programme provided in accordance with Section II, Chapter 1, 1.6, including a statement of safety policy and the responsibility of personnel.

### 3. Personnel training

3.1 Details of the flight crew training programme and requirements.

3.2 Details of the cabin crew duties training programme as required by Section II, Chapter 10, 10.3.

### 4. Fatigue and flight time limitations

Rules limiting the flight time and flight duty periods and providing for adequate rest periods for flight crew members and cabin crew.

### 5. Flight operations

5.1 The flight crew for each type of operation including the designation of the succession of command.

5.2 The in-flight and the emergency duties assigned to each crew member.

5.3 Specific instructions for the computation of the quantities of fuel and oil to be carried, having regard to all circumstances of the operation including the possibility of the failure of one or more powerplants while en route.

5.4 The conditions under which oxygen shall be used and the amount of oxygen determined in accordance with Section II, Chapter 2, 2.3.8.2.

5.5 Instructions for mass and balance control.

5.6 Instructions for the conduct and control of ground de/anti-icing operations.

5.7 The specifications for the operational flight plan.

5.8 The normal, abnormal and emergency procedures to be used by the flight crew, the checklists relating thereto and aircraft systems information as required by Section II, Chapter 4, 4.1.3.

5.9 Standard operating procedures (SOP) for each phase of flight.

5.10 Instructions on the use of normal checklists and the timing of their use.

5.11 Emergency evacuation procedures.

5.12 Departure contingency procedures.

5.13 Instructions on the maintenance of altitude awareness.

5.14 Instructions on the clarification and acceptance of ATC clearances, particularly where terrain clearance is involved.

5.15 Departure and approach briefings.

5.16 Route and destination familiarization.

5.17 Conditions required to commence or to continue an instrument approach.

5.18 Instructions for the conduct of precision and non-precision instrument approach procedures.

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5.19 Allocation of flight crew duties and procedures for the management of crew workload during night and IMC instrument approach and landing operations.

5.20 Information and instructions relating to the interception of civil aircraft including:

- a) procedures, as prescribed in Annex 2, for pilots-in-command of intercepted aircraft; and
- b) visual signals for use by intercepting and intercepted aircraft, as contained in Annex 2.

**6. Route guides and charts**

A route guide to ensure that the flight crew will have, for each flight, information relating to communication facilities, navigation aids, aerodromes, and such other information as the operator may deem necessary for the proper conduct of flight operations.

**7. Minimum flight altitudes**

- 7.1 The method for determining minimum flight altitudes.
- 7.2 The minimum flight altitudes for each route to be flown.

**8. Heliport operating minima**

8.1 The methods for determining heliport operating minima.

8.2 Heliport operating minima for each of the heliports that are likely to be used as heliports of intended landing or as alternate heliports.

8.3 The increase of heliport operating minima in case of degradation of approach or heliport facilities.

**9. Search and rescue**

9.1 The ground-air visual signal code for use by survivors, as contained in Annex 12.

9.2 Procedures, as prescribed in Annex 12, for pilots-in-command observing an accident.

**10. Dangerous goods**

Information and instructions on the carriage of dangerous goods, including action to be taken in the event of an emergency.

**11. Navigation**

A list of the navigational equipment to be carried.

**12. Communications**

The circumstances in which a radio listening watch is to be maintained.

**13. Security**

13.1 Security instructions and guidance.

13.2 The search procedure checklist provided in accordance with Section II, Chapter 11, 11.1.

**14. Human Factors**

Information on the operator's training programme for the development of knowledge and skills related to human performance.

*Note.— Information on knowledge and skills related to human performance can be found in Circular 216 (Human Factors Digest No. 1 — Fundamental Human Factors Concepts); Circular 217 (Human Factors Digest No. 2 — Flight Crew Training: Cockpit Resource Management (CRM) and Line-Oriented Flight Training (LOFT)); and Circular 227 (Human Factors Digest No. 3 — Training of Operational Personnel in Human Factors).*

## **ANNEX 6 — PART III**

### **ATTACHMENTS**

**5/11/98**



## ATTACHMENT A. HELICOPTER PERFORMANCE AND OPERATING LIMITATIONS

### Purpose and scope

The purpose of the following example is to illustrate the level of performance intended by the provisions of Section II, Chapter 3, and Section III, Chapter 3, of Annex 6, Part III, to the Convention.

### 1. Definitions

#### 1.1 Only applicable to performance Class 1 helicopters

**Landing distance required (LDRH).** The horizontal distance required to land and come to a full stop from a point 10.7 m (35 ft) above the landing surface.

**Rejected take-off distance required (RTODR).** The horizontal distance required from the start of the take-off to the point where the helicopter comes to a full stop following a power-unit failure and rejection of the take-off at the take-off decision point.

**Take-off distance required (TODRH).** The horizontal distance required from the start of the take-off to the point at which  $V_{\text{ROSS}}$ , a height of 10.7 m (35 ft) above the take-off surface, and a positive climb gradient are achieved, following failure of the critical power-unit at TDP, the remaining power-units operating within approved operating limits.

#### 1.2 Applicable to all classes of helicopters

**Distance DR.** DR is the horizontal distance that the helicopter has travelled from the end of the take-off distance available.

**Landing distance available (LDAH).** The length of the final approach and take-off area plus any additional area declared available and suitable for helicopters to complete the landing manoeuvre from a defined height.

**Take-off distance available (TODAH).** The length of the final approach and take-off area plus the length of helicopter clearway (if provided) declared available and suitable for helicopters to complete the take-off.

**Touchdown and lift-off area (TLOF).** A load bearing area on which a helicopter may touch down or lift off.

$V_y$  Best rate of climb speed.

### 2. General

#### 2.1 Significant factors

To determine the performance of the helicopter, account is taken of at least the following factors:

- a) mass of the helicopter;
- b) elevation or pressure-altitude and temperature;
- c) wind; for take-off and landing, accountability for wind shall be no more than 50 per cent of any reported steady head wind component of 5 knots or more. Where take-off and landing with a tail wind component is permitted in the flight manual, not less than 150 per cent of any reported tail wind component shall be allowed. Where precise wind measuring equipment enables accurate measurement of wind velocity over the point of take-off and landing, these values may be varied; and
- d) operating techniques.

2.2 For performance Class 2 or 3 helicopters in any flight phase where a power-unit failure may cause the helicopter to force land:

- a) a minimum visibility must be defined by the operator, taking into account the characteristics of the helicopter, but never less than 1 000 m for performance Class 2 helicopters and 1 500 m for performance Class 3 helicopters;
- b) the operator is obliged to verify that the surface below the intended flight path permits the pilot to execute a safe forced landing; in addition, in case of a flight over water, the operator must also verify that the helicopter has been certificated for ditching.

In addition, performance Class 3 operations are not to be performed:

- c) out of the sight of the surface; or
- d) at night; or
- e) when the cloud ceiling is less than 180 m (600 ft).

## Annex 6 — Operation of Aircraft

## Part III

## 3. Operating area considerations

## 3.1 Touchdown and lift-off area

On surface level heliports, the length or width of the undercarriage, whichever is the greater, does not exceed 2/3 the diameter of the circle contained in the touchdown and lift-off area. On elevated heliports and on helidecks, it is presumed that the FATO and the touchdown and lift-off area will be coincidental.

## 3.2 FATO

The over-all length or width of the helicopter, whichever is the greater, does not exceed 2/3 the smallest dimension of the FATO except in case of a water heliport. In this case, it does not exceed 1/2 the width of the FATO. If the FATO includes water surface, the helicopter is to be specifically approved in its flight manual for routine water operations including rejected take-off onto water surfaces. For performance Class 1 helicopters, the dimensions of the FATO are not less than those which are indicated in the flight manual of the helicopter.

## 3.3 Helicopter clearway

The over-all length or width of the helicopter, whichever is greater, does not exceed 2/3 the width of the helicopter clearway in case of a land heliport or half the width of the helicopter clearway in case of a water heliport.

## 4. Limitations resulting from performance

## 4.1 Performance Class 1 helicopters

## 4.1.1 Take-off

4.1.1.1 No helicopter is taken off at a mass that exceeds the maximum take-off mass specified in the flight manual for the altitude of the heliport and for the ambient temperature existing at the time of the take-off.

## 4.1.1.2 Take-off from a surface-level heliport (Figure A-1)

The take-off mass is such that:

- a) the rejected take-off distance required does not exceed the rejected take-off distance available;

- b) the take-off distance required does not exceed the take-off distance available; or

As an alternative (Figure A-2), the take-off distance required may be disregarded provided that the helicopter with the critical power-unit failure at the TDP can, when continuing the take-off, clear all obstacles between the end of the take-off distance available and the point at which it becomes established in a climb at  $V_{TOSS}$  by a vertical margin of 10.7 m (35 ft) or more. An obstacle is considered to be in the path of the helicopter if its distance from the nearest point on the surface below the intended line of flight does not exceed 30 m or 1.5 times the maximum dimension of the helicopter, whichever is greater.

## 4.1.1.3 Take-off from an elevated heliport or helideck (Figure A-3)

The take-off mass is such that:

- a) it is possible to reject the take-off and land on the FATO in case of the critical power-unit failure occurring before the TDP;
- b) it is possible to continue the flight if the critical power-unit failure occurs at or after the TDP. In this case, the flight path of the helicopter may descend below the height of the FATO in order to achieve  $V_{TOSS}$  if the following conditions are satisfied:
  - 1) A clearance margin is established in relation to the elevated heliport or helideck itself and to all obstacles located on the elevated heliport or helideck. 4.5 m (15 ft) has been found appropriate to a wide range of helicopters.
  - 2) The vertical clearance above all obstacles not located on the elevated heliport or helideck is at least equal to 10.7 m (35 ft). An obstacle is considered if its distance from the flight path does not exceed 30 m or 1.5 times the maximum dimension of the helicopter, whichever is greater.

## 4.1.2 Initial climb

4.1.2.1 The take-off mass is such that the climb path provides a vertical clearance of not less than 10.7 m (35 ft) for VFR operations and 10.7 m (35 ft) + 0.01 DR for IFR operations above all obstacles located in the climb path, the critical power-unit failure occurring at the TDP.

4.1.2.2 An obstacle is considered if its lateral distance from the nearest point on the surface below the intended flight path does not exceed 30 m or 1.5 times the over-all length of the helicopter, whichever is greater, plus:

**Attachment A**

- 0.10 DR for VFR day operations
- 0.15 DR for VFR night operations
- 0.30 DR for IFR operations without electronic guidance
- 0.15 DR for IFR operations with electronic guidance
- 0.10 DR for IFR operations with ILS or MLS guidance

except obstacles may be disregarded if they are situated beyond:

- a) 7 R\* for day operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;
- b) 10 R\* for night operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;
- c) 300 m if navigational accuracy can be achieved by navigation aids; and
- d) 900 m in the other cases.

4.1.2.3 Where a change of direction of more than 15° is made, obstacle clearance requirements are to be increased by 5 m (15 ft) from the point at which the turn is initiated. This turn is not to be initiated before reaching a height of 30 m (100 ft) above the take-off surface.

**4.1.3 En route**

The take-off mass is such that it is possible, in case of the critical power-unit failure occurring at any point of the flight path, to continue the flight to an appropriate landing site and achieve the minimum flight altitudes for the route to be flown.

**4.1.4 Approach, landing and balked landing**  
(Figures A-7 and A-8)

4.1.4.1 The estimated landing mass at the destination or alternate is such that:

- a) it does not exceed the maximum landing mass specified in the flight manual, taking into account the parameters specified in 2.1;
- b) the landing distance required does not exceed the landing distance available;
- c) in case of the critical power-unit failure occurring at any point after the LDP, it is possible to land and stop within the FATO; and
- d) in case of the critical power-unit failure occurring at any point before the LDP, it is possible either to land and stop within the FATO, or to overshoot and clear all obstacles in the flight path by a vertical interval of 10.7 m (35 ft) for VFR plus an additional margin of 0.01 DR for IFR.

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An obstacle is considered if its lateral distance from the nearest point on the surface below the intended line of flight does not exceed 30 m or 1.5 times the over-all length of the helicopter, whichever is greater, plus:

- 0.10 DR for VFR day operations
- 0.15 DR for VFR night operations
- 0.30 DR for IFR operations without electronic guidance
- 0.15 DR for IFR operations with electronic guidance
- 0.10 DR for IFR operations with ILS or MLS guidance

except obstacles may be disregarded if they are situated beyond:

- e) 7 R\* for day operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;
- f) 10 R\* for night operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;
- g) 300 m if navigational accuracy can be achieved by navigation aids; and
- h) 900 m in the other cases.

4.1.4.2 In case of a landing on an elevated heliport or helideck, the flight path may descend below the height of the landing surface in order to achieve  $V_{TOSS}$  if the following conditions are satisfied:

- a) A clearance margin is established in relation to the elevated heliport or helideck itself and to all obstacles located on the elevated heliport or helideck. 4.5 m (15 ft) has been found appropriate to a wide range of helicopters.
- b) The vertical clearance above all obstacles not located on the elevated heliport or helideck is at least equal to that specified in 4.1.4.1.

**4.2 Performance Class 2 helicopters****4.2.1 Take-off**  
(Figures A-4 and A-5)

4.2.1.1 The mass of the helicopter at take-off does not exceed the maximum take-off mass specified in the flight manual taking into account the parameters specified in 2.1.

4.2.1.2 The take-off mass is such that a safe forced landing can be achieved in the event of a power-unit failure prior to reaching the defined point after take-off.

\*R is the rotor radius.

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4.2.1.3 In case of a take-off from an elevated heliport or helideck and a failure of the critical power-unit occurring before  $V_y$  is obtained, the flight path may descend to achieve  $V_y$  if the following conditions are satisfied:

- a) A clearance margin is established in relation to the elevated heliport or helideck itself and to all obstacles located on the elevated heliport or helideck. 4.5 m (15 ft) has been found appropriate to a wide range of helicopters.
- b) The vertical clearance above all obstacles not located on the elevated heliport or helideck is at least equal to 10.7 m (35 ft). An obstacle is considered if its distance from the flight path does not exceed 30 m or 1.5 times the over-all length of the helicopter whichever is greater.

**4.2.2 Initial climb**

4.2.2.1 The take-off mass is such that the climb path provides a vertical clearance of not less than 10.7 m (35 ft) for VFR operations and 10.7 m (35 ft) + 0.01 DR for IFR operations above all obstacles located in the climb path, the critical power-unit failure occurring at the defined point after take-off.

4.2.2.2 An obstacle is considered if its lateral distance from the nearest point on the surface below the intended flight path does not exceed 30 m or 1.5 times the over-all length of the helicopter, whichever is greater, plus:

- 0.10 DR for VFR day operations
- 0.15 DR for VFR night operations
- 0.30 DR for IFR operations without electronic guidance
- 0.15 DR for IFR operations with electronic guidance
- 0.10 DR for IFR operations with ILS or MLS guidance

except obstacles may be disregarded if they are situated beyond:

- a) 7 R\* for day operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;
- b) 10 R\* for night operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;
- c) 300 m if navigational accuracy can be achieved by navigation aids; and
- d) 900 m in the other cases.

**4.2.3 En route**

The take-off mass is such that it is possible, in case of the critical power-unit failure occurring at any point of the flight

path, to continue the flight to an appropriate landing site and achieve the minimum flight altitudes for the route to be flown.

**4.2.4 Approach, landing and balked landing**  
(Figures A-9 and A-10)

4.2.4.1 The estimated landing mass at the destination or alternate is such that:

- a) it does not exceed the maximum landing mass specified in the flight manual, taking into account the parameters specified in 2.1;
- b) a safe forced landing can be achieved in the event of an engine failure after reaching the defined point before landing;
- c) it is possible to perform a balked landing, all engines operating, at any point of the flight path and clear all obstacles in the flight path by a vertical clearance of not less than:

- 10.7 m (35 ft) for VFR operations; and
- 10.7 m (35 ft) + 0.01 DR for IFR operations; and

- d) it is possible, in case of the critical power-unit failure occurring before the defined point before landing, either to land and stop within the FATO, or to overshoot and clear all obstacles in the flight path by a vertical interval of 10.7 m (35 ft).

An obstacle is considered if its lateral distance from the nearest point on the surface below the intended line of flight does not exceed 30 m or 1.5 times the over-all length of the helicopter, whichever is greater, plus:

- 0.10 DR for VFR day operations
- 0.15 DR for VFR night operations
- 0.30 DR for IFR operations without electronic guidance
- 0.15 DR for IFR operations with electronic guidance
- 0.10 DR for IFR operations with ILS or MLS guidance

except obstacles may be disregarded if they are situated beyond:

- e) 7 R\* for day operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;
- f) 10 R\* for night operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;
- g) 300 m if navigational accuracy can be achieved by navigation aids; and

\*R is the rotor radius.

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h) 900 m in the other cases.

4.2.4.2 In case of a landing on an elevated heliport or helideck, the flight path may descend below the height of the FATO in order to achieve  $V_y$  if the following conditions are satisfied:

- a) A clearance margin is established in relation to the elevated heliport or helideck itself and to all obstacles located on the elevated heliport or helideck. 4.5 m (15 ft) has been found appropriate to a wide range of helicopters;
- b) The vertical clearance above all obstacles not located on the elevated heliport or helideck is at least equal to that specified in 4.2.4.1.

#### 4.3 Performance Class 3 helicopters

##### 4.3.1 Take-off (Figure A-6)

4.3.1.1 The mass of the helicopter at take-off does not exceed the maximum take-off mass specified in the flight manual taking into account the parameters specified in 2.1.

4.3.1.2 The take-off mass is such that a safe forced landing can be achieved in the event of an engine failure.

##### 4.3.2 Initial climb

4.3.2.1 The take-off mass is such that the climb path provides a vertical clearance of not less than 10.7 m (35 ft) above all obstacles located along the climb path, all engines operating.

4.3.2.2 An obstacle is considered if its lateral distance from the nearest point on the surface below the intended flight path does not exceed 30 m or 1.5 times the over-all length of the helicopter, whichever is greater, plus 0.10 DR, except obstacles may be disregarded if they are situated beyond  $7 R^*$ .

##### 4.3.3 En route

The take-off mass is such that it is possible to achieve the minimum flight altitudes for the route to be flown, all engines operating.

##### 4.3.4 Approach, landing and balked landing (Figure A-11)

The estimated landing mass at the destination or alternate is such that:

- a) it does not exceed the maximum landing mass specified in the flight manual, taking into account the parameters specified in 2.1;
- b) a safe forced landing can be achieved in the event of an engine failure;
- c) it is possible to perform a balked landing, all engines operating, at any point of the flight path and clear all obstacles by a vertical interval of 10.7 m (35 ft).

An obstacle is considered if its lateral distance from the nearest point on the surface below the intended line of flight does not exceed 30 m or 1.5 times the over-all length of the helicopter, whichever is greater, plus 0.10 DR, except obstacles may be disregarded if they are situated beyond  $7 R^*$ .

\* $R$  is the rotor radius.

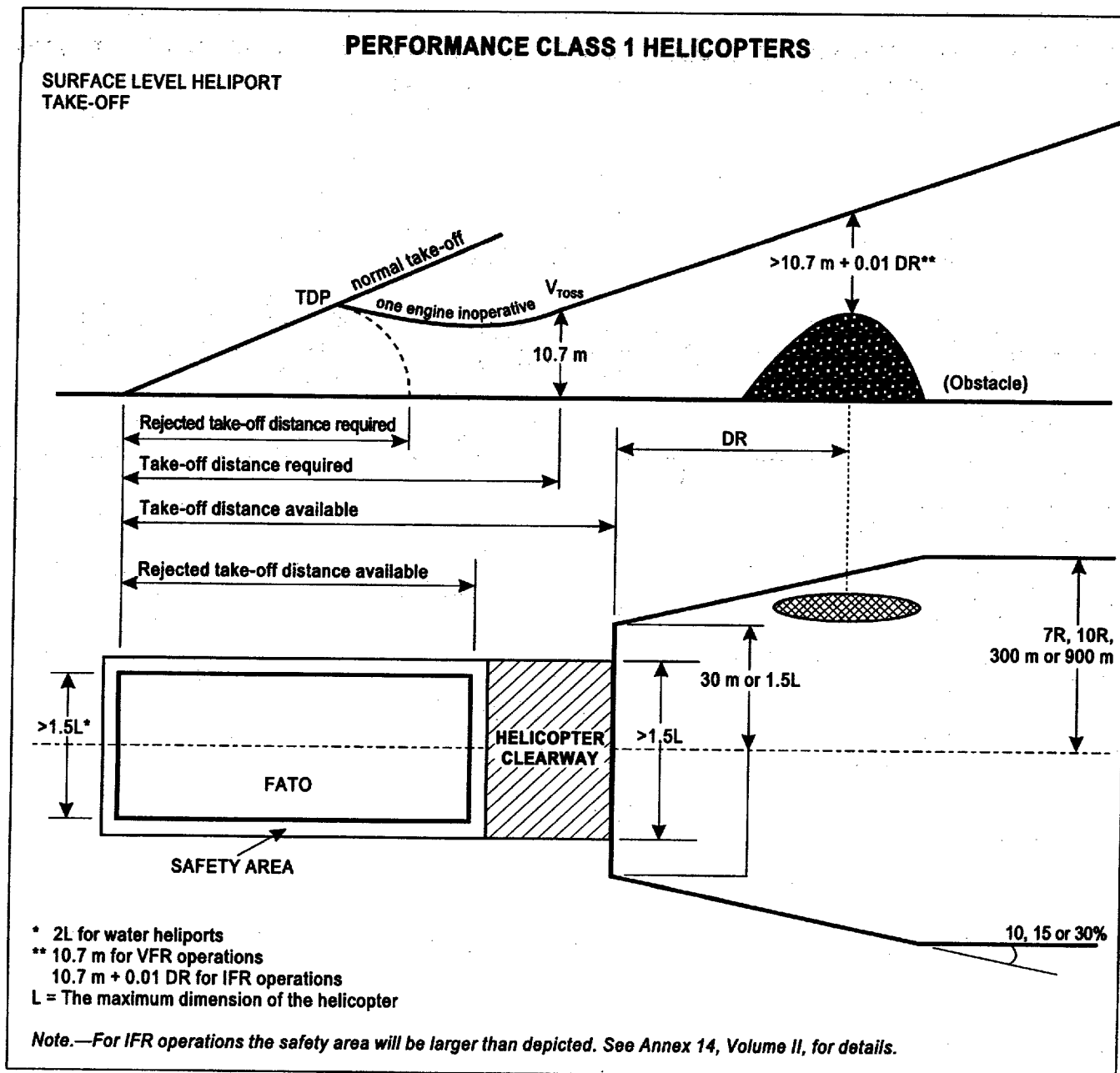


Figure A-1

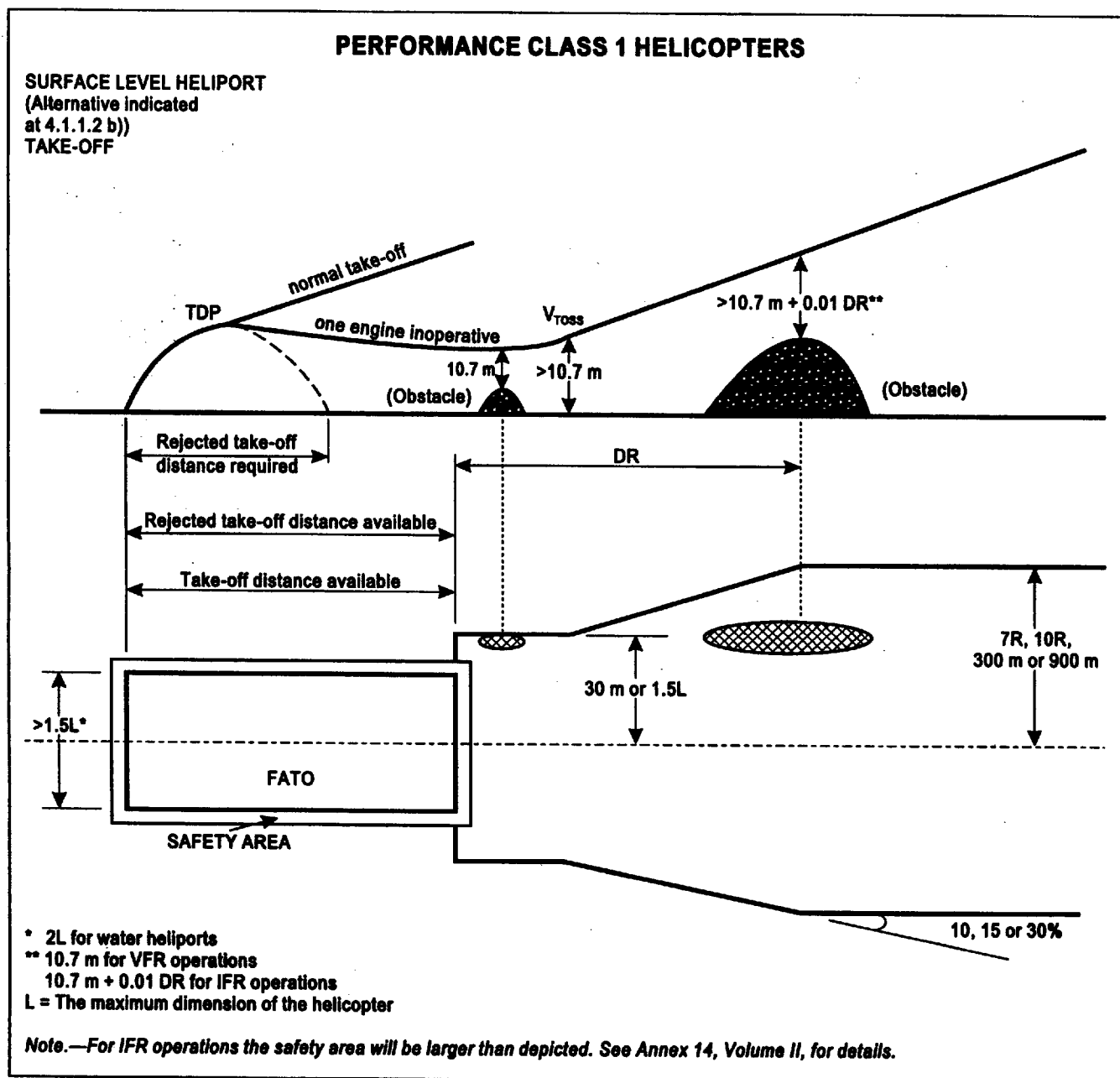


Figure A-2

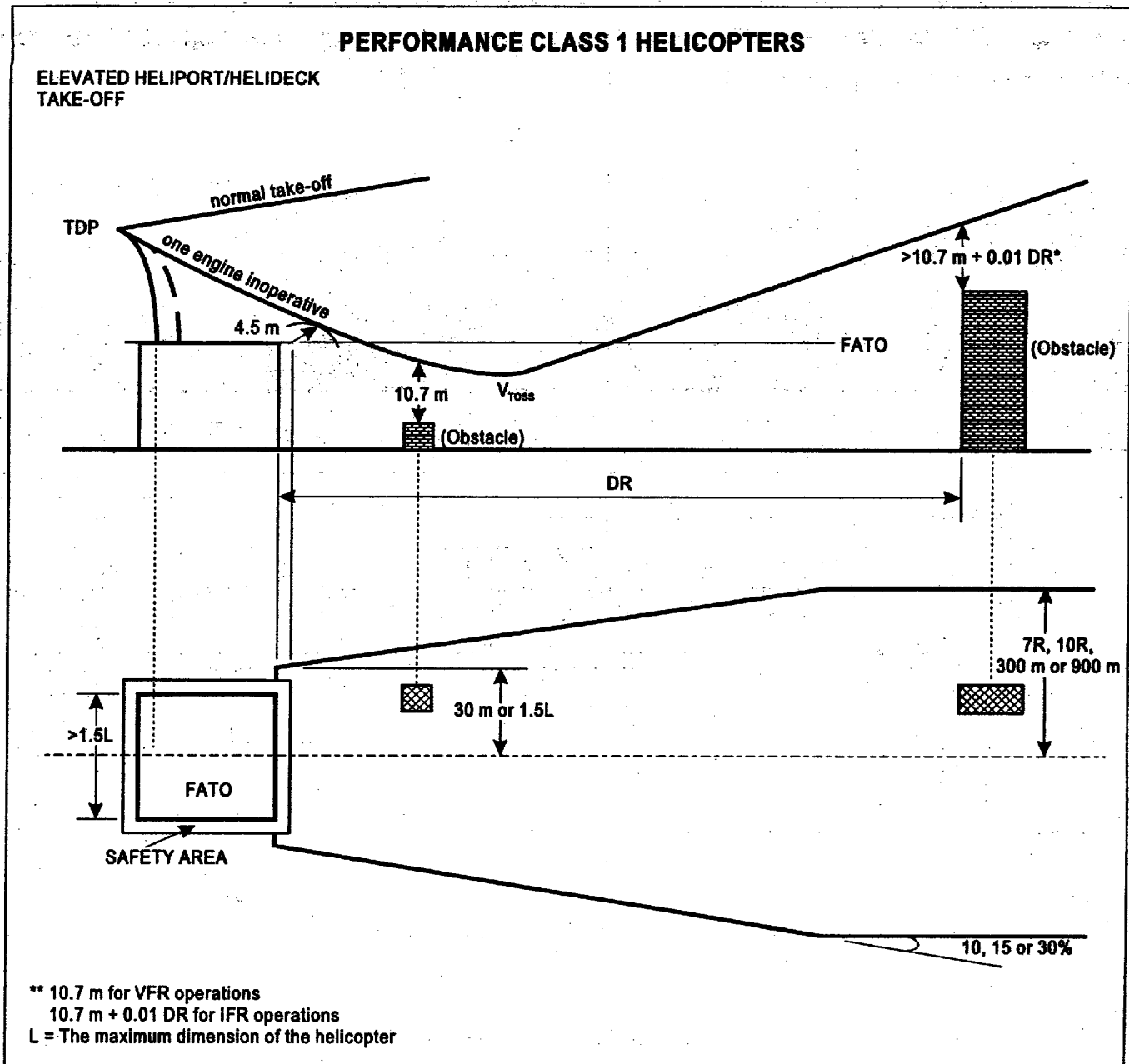


Figure A-3



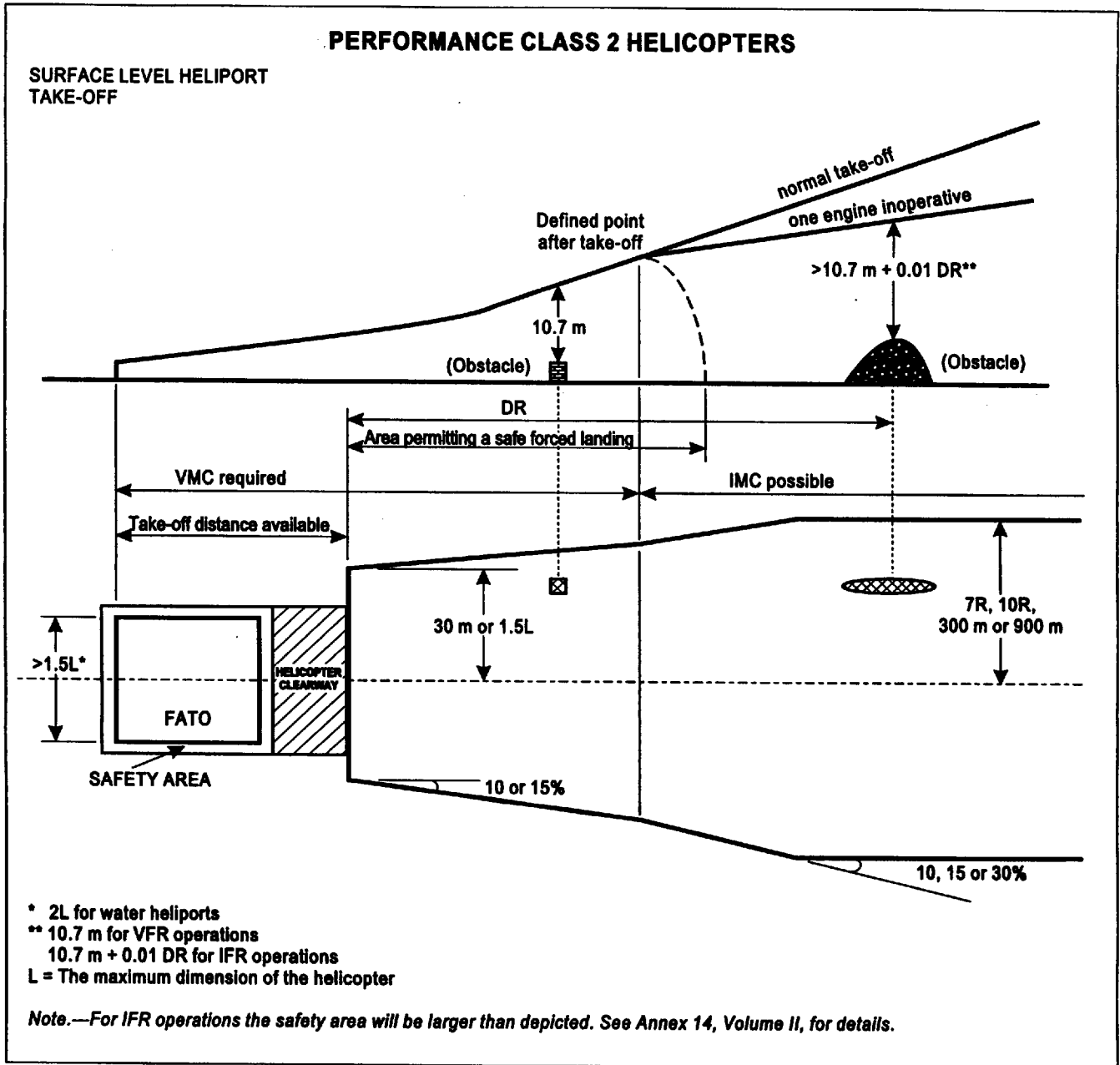


Figure A-4

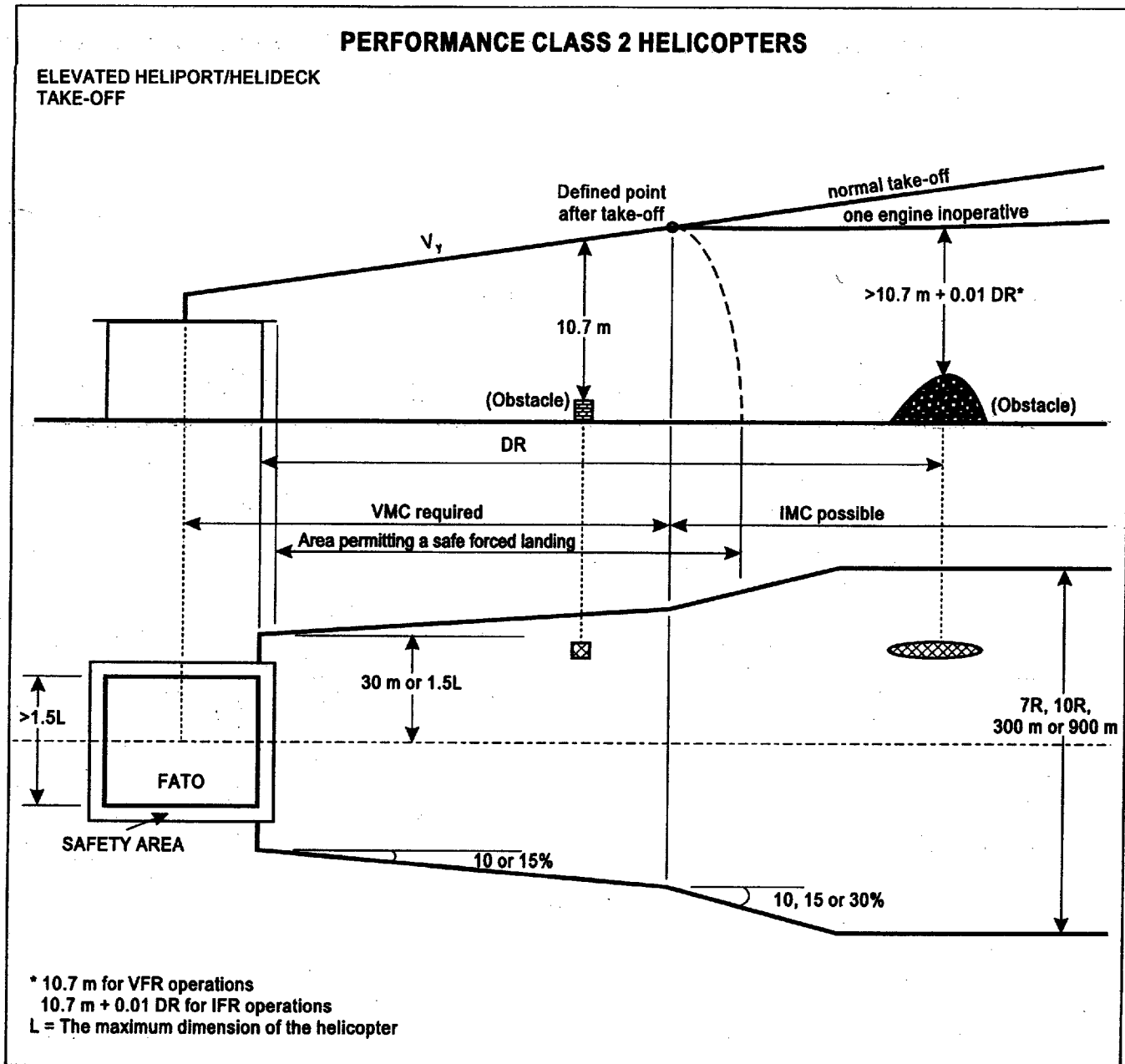


Figure A-5

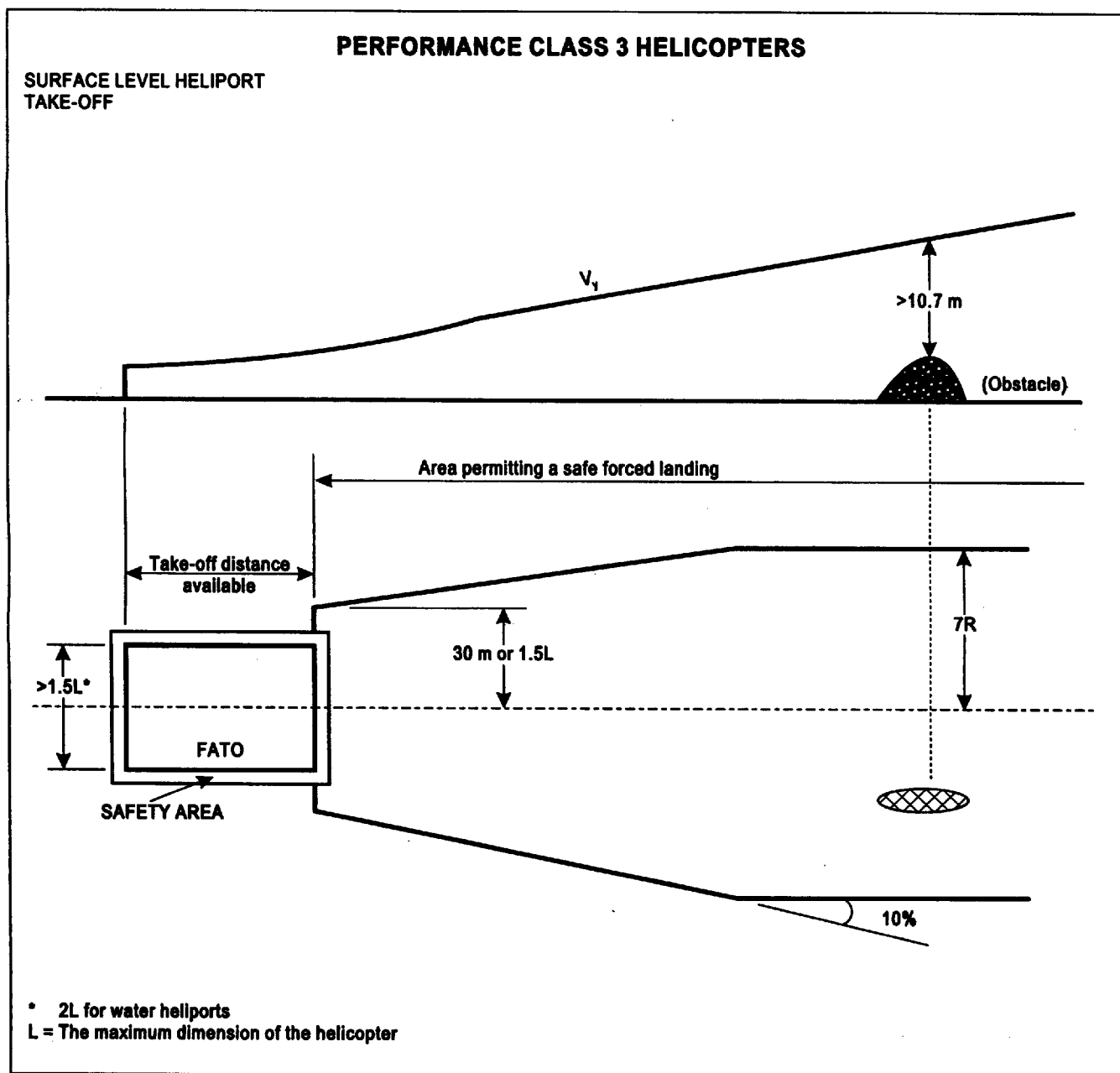


Figure A-6

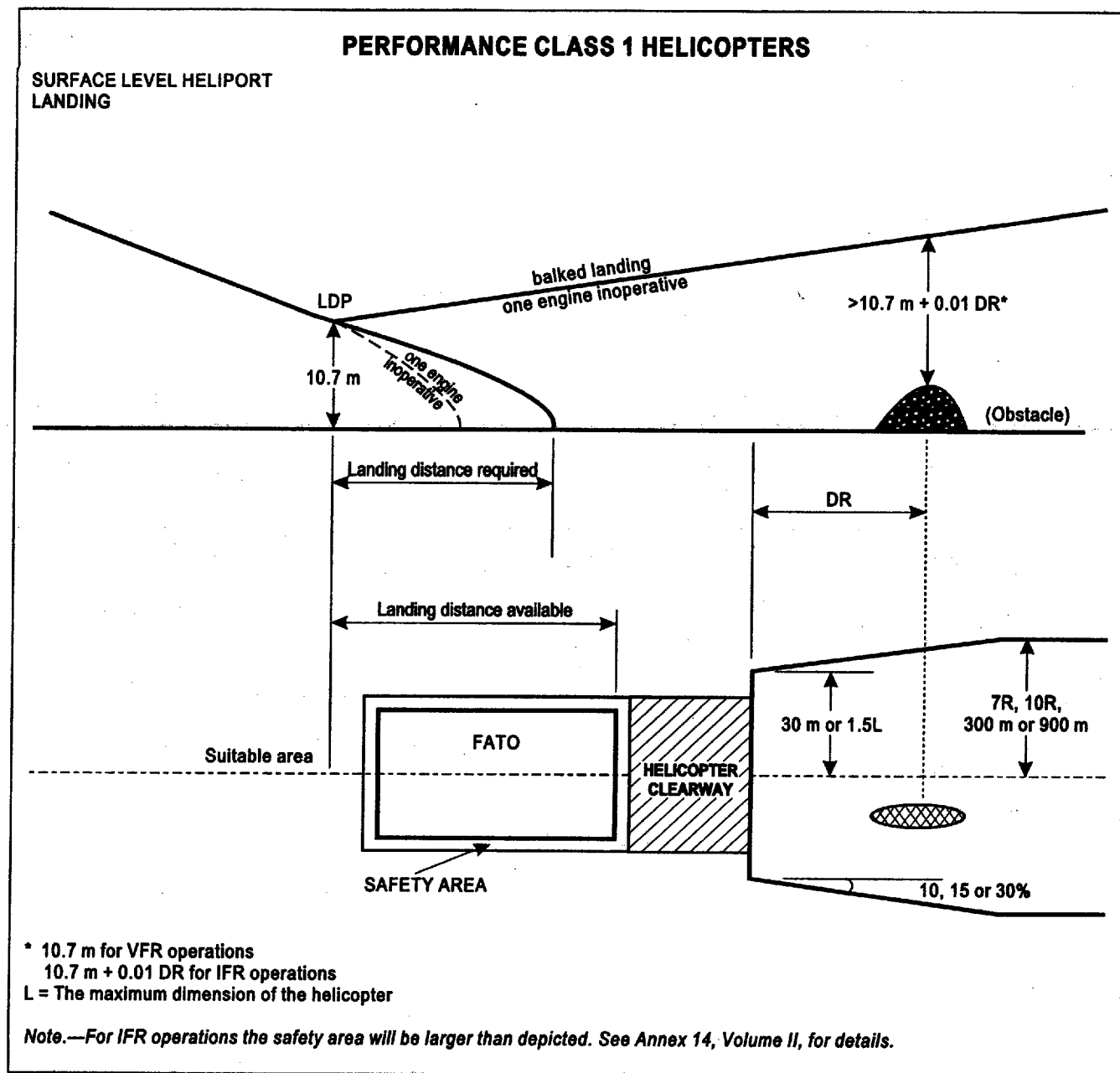


Figure A-7

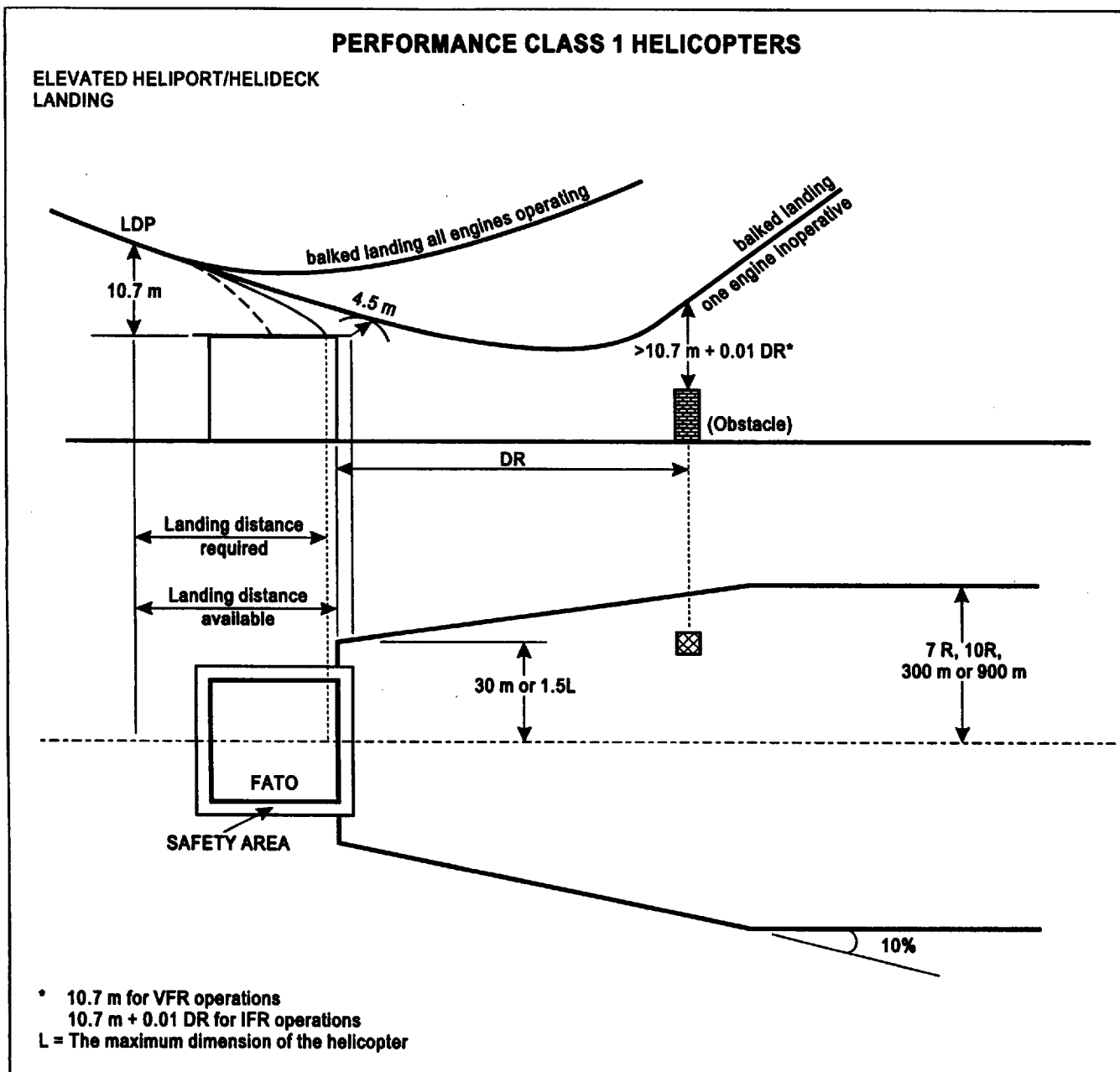


Figure A-8

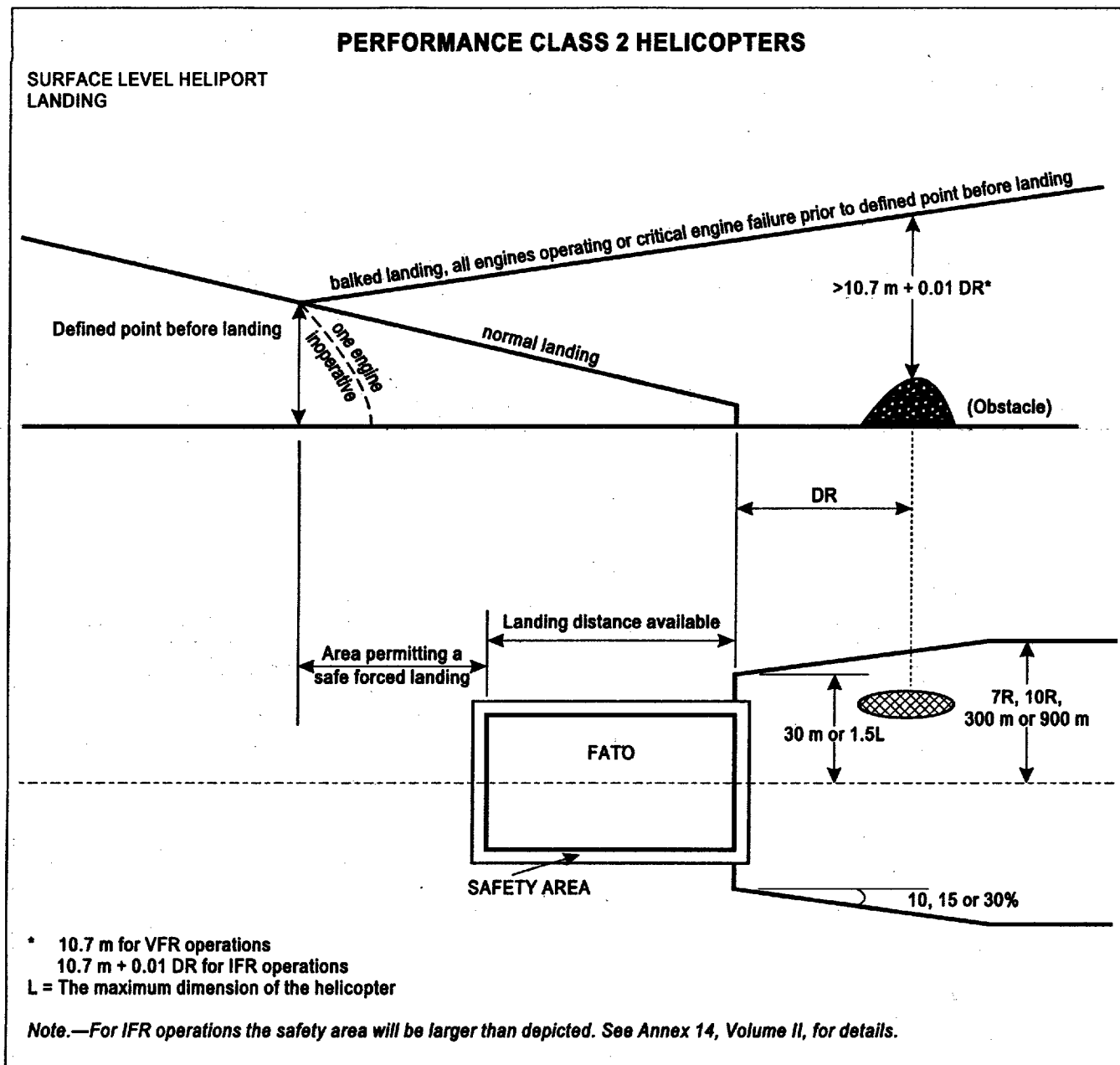


Figure A-9

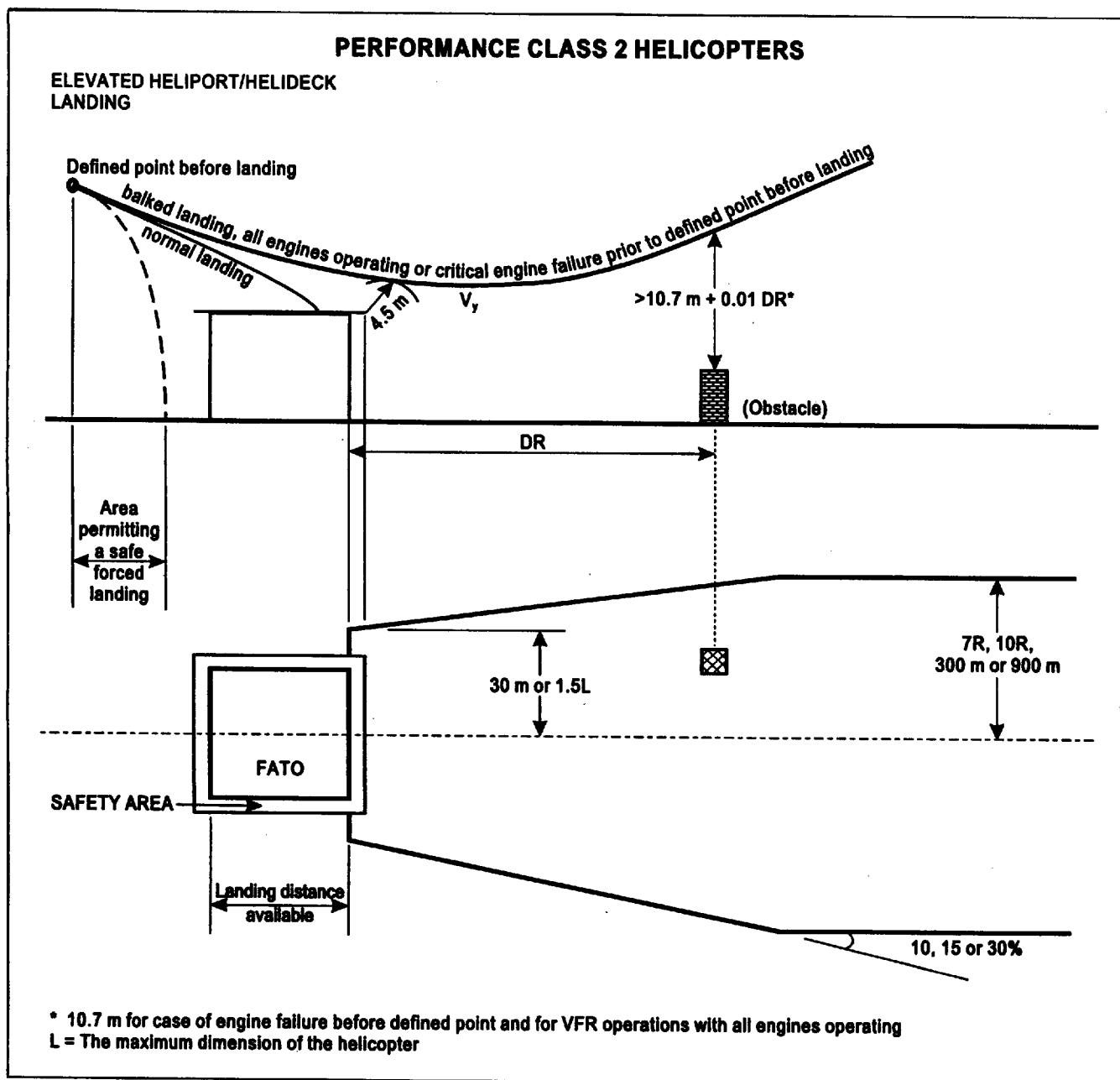


Figure A-10

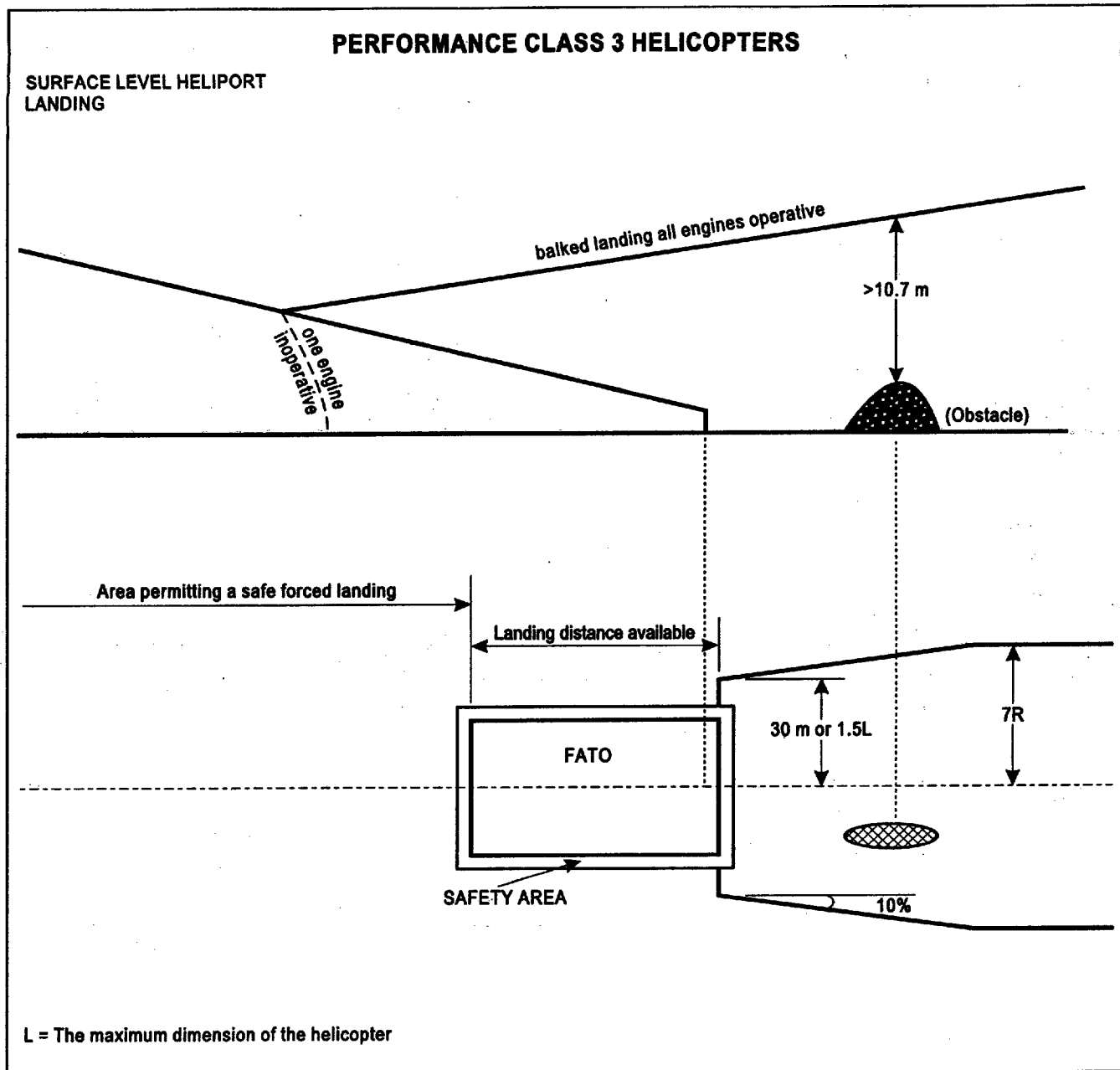


Figure A-11



**ATTACHMENT B. FLIGHT RECORDERS***Supplementary to Section II, 4.3 and Section III, 4.9***Introduction**

The material in this Attachment concerns flight recorders intended for installation in helicopters engaged in international air navigation. Flight recorders comprise two systems — a flight data recorder and a cockpit voice recorder. Flight data recorders for helicopters are classified as Type IV and Type V depending upon the number of parameters to be recorded.

**1. Flight data recorder (FDR)****1.1. General requirements**

1.1.1 The recorder is to record continuously during flight time.

1.1.2 The recorder container is to:

- a) be painted a distinctive orange or yellow colour;
- b) carry reflective material to facilitate its location; and
- c) have securely attached an automatically activated underwater locating device.

1.1.3 The recorder is to be installed so that:

- a) the probability of damage to the recording is minimized;
- b) it receives its electrical power from a bus that provides the maximum reliability for operation of the recorder without jeopardizing service to essential or emergency loads; and
- c) there is an aural or visual means for pre-flight checking that the recorder is operating properly.

**1.2. Parameters to be recorded**

1.2.1 *Type IV flight data recorder.* This recorder will be capable of recording, as appropriate to the helicopter, at least the thirty parameters in Table B-1. However, other parameters may be substituted with due regard to the helicopter type and the characteristics of the recording equipment.

1.2.2 *Type V flight data recorder.* This recorder will be capable of recording, as appropriate to the helicopter, at least

the first fifteen parameters in Table B-1. However, other parameters may be substituted with due regard to the helicopter type and the characteristics of the recording equipment.

**1.3. Additional information**

1.3.1 The measurement range, recording interval and accuracy of parameters on installed equipment is usually verified by methods approved by the appropriate certifying authority.

1.3.2 The manufacturer usually provides the national certifying authority with the following information in respect of the flight data recorder:

- a) manufacturer's operating instructions, equipment limitations and installation procedures;
- b) parameter origin or source and equations which relate counts to units of measurement; and
- c) manufacturer's test reports.

1.3.3 The operator usually supplies position error curves for pitot-static parameters, at various angles of attack and side slip, for the calibration and read-out of the recordings.

**2. Cockpit voice recorder (CVR)****2.1. General requirements**

2.1.1 The recorder is to be designed so that it will record at least the following:

- a) voice communication transmitted from or received in the aircraft by radio;
- b) aural environment on the flight deck;
- c) voice communication of flight crew members on the flight deck using the interphone system;
- d) voice or audio signals identifying navigation or approach aids introduced in the headset or speaker;
- e) voice communication of flight crew members using the passenger address system, if installed; and

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- f) digital communications with ATS, unless recorded by the flight data recorder.

## 2.1.2 The recorder container is to:

- a) be painted a distinctive orange or yellow colour;
- b) carry reflective material to facilitate its location; and
- c) have securely attached an automatically activated underwater locating device.

2.1.3 To aid in voice and sound discrimination, microphones in the cockpit are to be located in the best position for recording voice communications originating at the pilot and co-pilot stations and voice communications of other crew members on the flight deck when directed to those stations. This can best be achieved by wiring suitable boom microphones to record continuously on separate channels.

## 2.1.4 The recorder is to be installed so that:

- a) the probability of damage to the recording is minimized;
- b) it receives its electrical power from a bus that provides the maximum reliability for operation of the recorder without jeopardizing service to essential or emergency loads;
- c) there is an aural or visual means for pre-flight checking of the recorder for proper operation; and
- d) if the recorder has a bulk erasure device, the installation should be designed to prevent operation of the device during flight time or crash impact.

## 2.2 Performance requirements

2.2.1 The recorder will be capable of recording on at least four tracks simultaneously. To ensure accurate time correlation between tracks, the recorder is to record in an in-line format. If a bi-directional configuration is used, the in-line format and track allocation should be retained in both directions.

## 2.2.2 The preferred track allocation is as follows:

Track 1 — co-pilot headphones and live boom microphone

Track 2 — pilot headphones and live boom microphone

Track 3 — area microphone

Track 4 — time reference, main rotor speed or the flight deck vibration environment, the third and fourth crew member's headphone and live microphone, if applicable.

*Note 1.— Track 1 is located closest to the base of the recording head.*

*Note 2.— The preferred track allocation presumes use of current conventional magnetic tape transport mechanisms, and is specified because the outer edges of the tape have a higher risk of damage than the middle. It is not intended to preclude use of alternative recording media where such constraints may not apply.*

2.2.3 The recorder, when tested by methods approved by the appropriate certificating authority, will be demonstrated to be suitable for the environmental extremes over which it is designed to operate.

2.2.4 Means will be provided for an accurate time correlation between the flight data recorder and cockpit voice recorder.

*Note.— One method of achieving this is by superimposing the FDR time signal on the CVR.*

## 2.3 Additional information

The manufacturer usually provides the national certificating authority with the following information in respect of the cockpit voice recorder:

- a) manufacturer's operating instructions, equipment limitations and installation procedures; and
- b) manufacturer's test reports.

## 3. Inspections of flight data and cockpit voice recorder systems

3.1 Prior to the first flight of the day the built-in test features on the flight deck for the CVR, FDR and Flight Data Acquisition Unit (FDAU), when installed, should be monitored.

## 3.2 Annual inspections should be carried out as follows:

- a) the readout of the recorded data from the FDR and CVR should ensure that the recorder operates correctly for the nominal duration of the recording;
- b) the analysis of the FDR should evaluate the quality of the recorded data to determine if the bit error rate is within acceptable limits and to determine the nature and distribution of the errors;
- c) a complete flight from the FDR should be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention should be given to parameters from sensors dedicated to the FDR.

**Attachment B**

Parameters taken from the aircraft's electrical bus system need not be checked if their serviceability can be detected by other aircraft systems;

- d) the readout facility should have the necessary software to accurately convert the recorded values to engineering units and to determine the status of discrete signals;
- e) an annual examination of the recorded signal on the CVR should be carried out by re-play of the CVR recording. While installed in the aircraft the CVR should record test signals from each aircraft source and from relevant external sources to ensure that all required signals meet intelligibility standards; and
- f) where practicable, during the annual examination, a sample of in-flight recordings of the CVR should be examined for evidence that the intelligibility of the signal is acceptable.

3.3 Flight recorder systems should be considered unserviceable if there is a significant period of poor quality data,

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unintelligible signals, or if one or more of the mandatory parameters is not recorded correctly.

3.4 A report of the annual inspection should be made available on request to the State's regulatory authority for monitoring purposes.

3.5 Calibration of the FDR system:

- a) the FDR system should be re-calibrated at least every five years to determine any discrepancies in the engineering conversion routines for the mandatory parameters, and to ensure that parameters are being recorded within the calibration tolerances; and
- b) when the parameters of altitude and airspeed are provided by sensors that are dedicated to the FDR system, there should be a re-calibration performed as recommended by the sensor manufacturer, or at least every two years.

Table B-1  
Helicopters — Parameters for Flight Data Recorders

Serial number	Parameter	Measurement range	Recording interval (seconds)	Accuracy limits (sensor input compared to FDR read-out)
1	Time (UTC when available, otherwise elapsed time)	24 hours	4	±0.125% per hour
2	Pressure-altitude	-300 m (-1 000 ft) to maximum certificated altitude of aircraft +1 500 m (+5 000 ft)	1	±30 m to ±200 m (±100 ft to ±700 ft)
3	Indicated airspeed	As the installed measuring system	1	±3%
4	Heading	360°	1	±2°
5	Normal acceleration	-3 g to +6 g	0.125	±1%
6	Pitch attitude	±75°	0.5	±2°
7	Roll attitude	±180°	0.5	±2°
8	Radio transmission keying	On-off (one discrete)	1	
9	Power on each engine (Note 1)	Full range	1 (per engine)	±2%
10	Main rotor speed	50-130%	0.5	±2%
11	Pilot input and/or control surface position-primary controls (Collective pitch, longitudinal cyclic pitch, lateral cyclic pitch, tail rotor pedal) (Note 2)	Full range	1	±2% unless higher accuracy uniquely required.
12	Hydraulics, each system (low pressure)	Discrete	2	
13	Outside air temperature	Sensor range	2	±2°C
14	Autopilot/auto throttle/AFCS mode and engagement status	A suitable combination of discretes	1	
15	Stability augmentation system engagement	Discrete	1	
<i>Note.— The preceding 15 parameters satisfy the requirements for a Type V FDR.</i>				
16	Main gearbox oil pressure	As installed	1	As installed
17	Main gearbox oil temperature	As installed	2	As installed
18	Yaw acceleration (or yaw rate)	±1 g	0.25	±1.5% max range excluding datum error of ±5%
19	Sling load force	0-200% of certified load	0.5	±3% of max range

## Attachment B

## Annex 6 — Operation of Aircraft

Serial number	Parameter	Measurement range	Recording interval (seconds)	Accuracy limits (sensor input compared to FDR read-out)
20	Longitudinal acceleration	$\pm 1$ g	0.25	$\pm 1.5\%$ max range excluding datum error of $\pm 5\%$
21	Lateral acceleration	$\pm 1$ g	0.25	$\pm 1.5\%$ max range excluding datum error of $\pm 5\%$
22	Radio altitude	-6 m to 750 m (-20 ft to 2 500 ft)	1	$\pm 0.6$ m ( $\pm 2$ ft) or $\pm 3\%$ whichever is greater below 150 m (500 ft) and $\pm 5\%$ above 150 m (500 ft)
23	Glide path deviation	Signal range	1	$\pm 3\%$
24	Localizer deviation	Signal range	1	$\pm 3\%$
25	Marker beacon passage	Discrete	1	
26	Master warning	Discrete	1	
27	NAV 1 and 2 frequency selection (Note 3)	Full range	4	As installed
28	DME 1 and 2 distance (Notes 3 and 4)	0-370 km	4	As installed
29	Navigation data (latitude/longitude, ground speed) (Note 5)	As installed	2	As installed
30	Landing gear or gear selector position	Discrete	4	As installed

Note.— The preceding 30 parameters satisfy the requirements for a Type IV FDR.

## Notes.—

1. Record sufficient inputs to determine power.
2. For helicopters with conventional control systems "or" applies. For helicopters with non-mechanical control systems "and" applies.
3. If signal available in digital form.
4. Recording of latitude and longitude from INS or other navigation system is a preferred alternative.
5. If signals readily available.

**Annex 6 — Operation of Aircraft****Part III**

If further recording capacity is available, recording of the following additional information should be considered:

- a) operational information from electronic display systems, such as electronic flight instrument systems (EFIS), electronic centralized aircraft monitor (ECAM) and engine indication and crew alerting system (EICAS). Use the following order of priority:
  - 1) parameters selected by the flight crew relating to the desired flight path, e.g. barometric pressure setting, selected altitude, selected airspeed, decision height, and autoflight system engagement and mode indications if not recorded from another source;
  - 2) display system selection/status, e.g. SECTOR, PLAN, ROSE, NAV, WXR, COMPOSITE, COPY, etc.;
  - 3) warnings and alerts data; and
  - 4) the identity of displayed pages for emergency procedures and checklists; and
- b) additional engine parameters (EPR, N1, EGT, fuel flow, etc.).

## ATTACHMENT C. FLIGHT TIME AND FLIGHT DUTY PERIOD LIMITATIONS

*Supplementary to Section II, 2.2.9.3*

### 1. Purpose and scope

1.1 Flight time and flight duty period limitations are established for the sole purpose of reducing the probability that fatigue of flight crew members may adversely affect the safety of flight.

1.2 In order to guard against this, two types of fatigue must be taken into account, namely, transient fatigue and cumulative fatigue. Transient fatigue may be described as fatigue which is normally experienced by a healthy individual following a period of work, exertion or excitement, and it is normally dispelled by a single sufficient period of sleep. On the other hand cumulative fatigue may occur after delayed or incomplete recovery from transient fatigue or as the after-effect of more than a normal amount of work, exertion or excitement without sufficient opportunity for recuperation.

1.3 Limitations based on the provisions of this Part of the Annex will provide safeguards against both kinds of fatigue because they will recognize:

1.3.1 The necessity to limit flight time in such a way as to guard against both kinds of fatigue.

1.3.2 The necessity to limit time spent on duty on the ground immediately prior to a flight or at intermediate points during a series of flights in such a way as to guard particularly against transient fatigue.

1.3.3 The necessity to provide flight crew members with adequate opportunity to recover from fatigue.

1.3.4 The necessity of taking into account other related tasks the flight crew member may be required to perform in order to guard particularly against cumulative fatigue.

### 2. General

2.1 The responsibility rests with the pilot, not to exercise the privileges of the licence and related ratings at any time when aware of any decrease in medical fitness which might render the pilot unable to safely exercise these privileges, including any decrease in medical fitness through fatigue.

2.2 The limitations laid down in the following paragraphs are to be considered as minimum requirements and it is the responsibility of the operator to adjust them in certain cases,

having regard to the factors mentioned below. Specific factors to be taken into consideration are:

- a) the crew composition of the aircraft;
- b) the probability of operational delays;
- c) the type of aircraft and route complexities such as traffic density, navigation aids, standard of equipment carried, communication difficulties, and high altitude flying in unpressurized aircraft, or flying with high cabin altitudes in pressurized aircraft;
- d) the proportion of night flying involved;
- e) the extent to which the accommodation at layovers is such as to permit crews to secure real rest;
- f) the number of landings and take-offs;
- g) the need for an orderly scheduling system, giving a high degree of stability (for this, provision of adequate reserves is an important factor);
- h) especially sleep deprivation arising from interruption of the normal sleep/wake cycle; and
- i) cockpit environment.

2.3 For reasons of flight safety, the operator has the responsibility to ensure that crew members engaged in duties other than flight duties performed on behalf of the employer are provided with at least the minimum required rest periods before engaging in flight duties.

### 3. Definitions

**Deadheading crew.** A crew member positioned by the operator in flight or by surface transport.

**Duty period.** The time during which a flight crew member carries out any duty at the behest of the flight crew member's employer.

**Flight duty period.** The total time from the moment a flight crew member commences duty, immediately subsequent to a rest period and prior to making a flight or a series of flights, to the moment the flight crew member is relieved of all duties having completed such flight or series of flights.

**Annex 6 — Operation of Aircraft****Part III**

**Flight sector.** A flight or one of a series of flights which commences at a parking place of the aircraft and terminates at a parking place of the aircraft.

It is composed of:

- flight preparation,
- flight time,
- post-flight period after the flight sector or series of flight sectors.

**Flight time.** The total time from the moment an aircraft first moves under its own power for the purpose of taking off until the moment it comes to rest at the end of the flight.

*Note 1.— Flight time as here defined is synonymous with the term "block to block" time or "chock to chock" time in general usage which is measured from the time an aircraft moves from the loading point until it stops at the unloading point.*

*Note 2.— Whenever helicopter rotors are engaged, the time will be included in the flight time.*

**Rest period.** Any period of time on the ground during which a flight crew member is relieved of all duties by the operator.

**Series of flights.** Two or more flight sectors accomplished in between two rest periods.

**Standby.** A defined period during which a crew member may be called for duty with minimum notice.

**Turnaround time.** The time spent on the ground during a flight duty period between two flight sectors.

#### **4. Comments about the definitions**

##### **4.1 Flight time**

The definition of flight time is of necessity very general but in the context of limitations it is, of course, intended to apply to flight crew members in accordance with the relevant definition of a flight crew member. Pursuant to that latter definition, licensed crew personnel travelling as passengers cannot be considered flight crew members, although this should be taken into account in arranging rest periods.

##### **4.2 Flight duty periods**

4.2.1 The definition of flight duty period is intended to cover a continuous period of duty which always includes a flight or a series of flights. It is meant to include all duties a

flight crew member may be required to carry out from the moment the flight crew member reports at the place of employment on the day of a flight until relieved of duties, having completed the flight or series of flights. It is considered necessary that this period should be subject to limitations because a flight crew member's activities within the limits of such period would eventually induce fatigue — transient or cumulative — which could endanger the safety of a flight. There is on the other hand (from the point of view of flight safety) insufficient reason to establish limitations for any other time during which a flight crew member is performing a task assigned by the operator. Such task should, therefore, only be taken into account when making provisions for rest periods as one among many factors which could lead to fatigue.

4.2.2 The definition does not imply the inclusion of such periods as time taken for a flight crew member to travel from the flight crew member's home to the place of employment.

4.2.3 An important safeguard may be established if States and operators recognize the right of a crew member to refuse further flight duty when suffering from fatigue of such a nature as to affect adversely the safety of flight.

#### **4.3 Rest periods**

The definition of rest period implies an absence of duty and is intended to be for the purpose of recovering from fatigue; the way in which this recovery is achieved is the responsibility of the individual.

### **5. Types of limitations**

5.1 Limitations are broadly divided by time; for example, the majority of States reporting to ICAO prescribe daily, monthly and yearly flight time limitations, and a considerable number also prescribe quarterly flight time limitations. It will probably be sufficient to prescribe flight duty period limitations on a daily basis. It must be understood, however, that these limitations will vary considerably taking into account a variety of situations.

5.2 In formulating regulations or rules governing flight time limitations the size of the crew complement and the extent to which the various tasks to be performed can be divided among the crew members should be taken into account; and in the case where adequate facilities for relief are provided in the aircraft in such a way that a crew member may have horizontal rest and a degree of privacy, flight duty periods could be extended. Adequate rest facilities on the ground are required at places where relief periods are to be given. Also States or operators should give due weight to the following factors: traffic density; navigational and communication facilities; rhythm of work/sleep cycle; number of landings and take-offs; aircraft handling and performance characteristics and weather conditions.



**Attachment C****6. Pro forma table**

For example, the following pro forma table is provided to illustrate one of many forms in which the Standard at Section II, 2.2.9.3 of Annex 6, Part III, may be implemented.

<i>Crew</i>	<i>Maximum flight duty period in 24 hours</i>	<i>Maximum flight time (hours)</i>				<i>Rest periods</i>	
		<i>Daily 24 hours</i>	<i>Monthly</i>	<i>Quarterly</i>	<i>Annually</i>	<i>Daily</i>	<i>Per week</i>
Pilot-in-command							
1st Officer							

**Annex 6 — Operation of Aircraft****7. ICAO circular on flight crew fatigue and flight time limitations**

ICAO Circular 52 contains a compendium of States' actions to implement the Standard of Annex 6 in respect to limiting the flight time and flight duty periods of flight crew members.

**ATTACHMENT D. MEDICAL SUPPLIES***Supplementary to Section II, 4.2.2.1 a)*

The following is suggested as being typical contents of a first-aid kit for carriage aboard a helicopter:

- a handbook on first aid
  - “ground-air visual signal code for use by survivors” as contained in Annex 12
  - materials for treating injuries
  - ophthalmic ointment
  - a decongestant nasal spray
  - insect repellent
  - emollient eye drops
  - sunburn cream
  - water-miscible antiseptic/skin cleanser
  - materials for treatment of extensive burns
  - oral drugs as follows:
    - analgesic, antispasmodic, central nervous system stimulant, circulatory stimulant, coronary vasodilator, antidiarrhoeic and motion sickness medications.
  - an artificial plastic airway and splints.
-

**ATTACHMENT E. MINIMUM EQUIPMENT LIST (MEL)***Supplementary to Section II, 4.1.2*

1. If deviations from the requirements of States in the certification of aircraft were not permitted an aircraft could not be flown unless all systems and equipment were operable. Experience has proved that some unserviceability can be accepted in the short term when the remaining operative systems and equipment provide for continued safe operations.

2. The State should indicate through approval of a minimum equipment list those systems and items of equipment that may be inoperative for certain flight conditions with the intent that no flight can be conducted with inoperative systems and equipment other than those specified.

3. A minimum equipment list, approved by the State of the Operator, is therefore necessary for each aircraft, based on the master minimum equipment list established for the aircraft type by the organization responsible for the type design in conjunction with the State of Design.

4. The State of the Operator should require the operator to prepare a minimum equipment list designed to allow the operation of an aircraft with certain systems or equipment inoperative provided an acceptable level of safety is maintained.

5. The minimum equipment list is not intended to provide for operation of the aircraft for an indefinite period with inoperative systems or equipment. The basic purpose of the minimum equipment list is to permit the safe operation of an aircraft with inoperative systems or equipment within the framework of a controlled and sound programme of repairs and parts replacement.

6. Operators are to ensure that no flight is commenced with multiple minimum equipment list items inoperative without determining that any interrelationship between inoperative systems or components will not result in an unacceptable degradation in the level of safety and/or undue increase in the flight crew workload.

7. The exposure to additional failures during continued operation with inoperative systems or equipment must also be considered in determining that an acceptable level of safety is being maintained. The minimum equipment list may not deviate from requirements of the flight manual limitations section, emergency procedures or other airworthiness requirements of the State of Registry or of the State of the Operator unless the appropriate airworthiness authority or the flight manual provides otherwise.

8. Systems or equipment accepted as inoperative for a flight should be placarded where appropriate and all such items should be noted in the aircraft technical log to inform the flight crew and maintenance personnel of the inoperative system or equipment.

9. For a particular system or item of equipment to be accepted as inoperative, it may be necessary to establish a maintenance procedure, for completion prior to flight, to deactivate or isolate the system or equipment. It may similarly be necessary to prepare an appropriate flight crew operating procedure.

10. The responsibilities of the pilot-in-command in accepting a helicopter for operation with deficiencies in accordance with a minimum equipment list are specified in 2.3.1.

## ATTACHMENT F. AIR OPERATOR CERTIFICATE OR EQUIVALENT DOCUMENT

*Supplementary to Section II, 2.2.1*

1. The State of the Operator regulations and rules for the operational certification of operators and the conduct of subsequent commercial air transport operations should be in conformity with the Annexes to the Convention on International Civil Aviation and have sufficient detail to ensure that compliance will result in the desired level of safety.

2. The State of the Operator regulations should provide a framework of positive control and guidance but also allow the operator sufficient flexibility to develop and update instructions for the detailed guidance of personnel essential to the conduct of operations.

3. The State of the Operator regulations should require the operator to submit detailed information on the organization, method of control and supervision of flight operations, training programme and maintenance arrangements as a basis for operational certification. As required by this part, the operator's material should be submitted in the form of an operations manual and a maintenance manual containing at least the material specified in Section II, 9.1 and 9.3 and such other material as the State may require.

4. The State of the Operator, in addition to assessing the operator's ability and competence, should guide the operator in

regulatory, organizational and procedural matters. The State of the Operator should be satisfied concerning the operator's eligibility for operational certification. This includes the ability and competence to conduct safe and efficient operations and proof of compliance with applicable regulations.

5. Continuing surveillance by the State of the Operator of an air operator certificate holder's operations is inherent in the system of certification and is an essential part of the State's responsibility to ensure that the required standards of operations are maintained in order to provide a safe and reliable commercial air transportation service to the public. Adequate authority for certification and continuing surveillance of an air operator certificate holder's operations should be contained in the provisions of the basic aviation law of the State.

*Note 1.— Guidance on the operations manual is given in the manual Preparation of an Operations Manual (Doc 9376).*

*Note 2.— Guidance on the certification and continued surveillance of the operator is given in the Manual of Procedures for Operations Inspection, Certification and Continued Surveillance (Doc 8335).*

— END —

## ICAO TECHNICAL PUBLICATIONS

*The following summary gives the status, and also describes in general terms the contents of the various series of technical publications issued by the International Civil Aviation Organization. It does not include specialized publications that do not fall specifically within one of the series, such as the Aeronautical Chart Catalogue or the Meteorological Tables for International Air Navigation.*

**International Standards and Recommended Practices** are adopted by the Council in accordance with Articles 54, 37 and 90 of the Convention on International Civil Aviation and are designated, for convenience, as Annexes to the Convention. The uniform application by Contracting States of the specifications contained in the International Standards is recognized as necessary for the safety or regularity of international air navigation while the uniform application of the specifications in the Recommended Practices is regarded as desirable in the interest of safety, regularity or efficiency of international air navigation. Knowledge of any differences between the national regulations or practices of a State and those established by an International Standard is essential to the safety or regularity of international air navigation. In the event of non-compliance with an International Standard, a State has, in fact, an obligation, under Article 38 of the Convention, to notify the Council of any differences. Knowledge of differences from Recommended Practices may also be important for the safety of air navigation and, although the Convention does not impose any obligation with regard thereto, the Council has invited Contracting States to notify such differences in addition to those relating to International Standards.

**Procedures for Air Navigation Services (PANS)** are approved by the Council for world-wide application. They contain, for the most part, operating procedures regarded as not yet having attained a sufficient degree of

maturity for adoption as International Standards and Recommended Practices, as well as material of a more permanent character which is considered too detailed for incorporation in an Annex, or is susceptible to frequent amendment, for which the processes of the Convention would be too cumbersome.

**Regional Supplementary Procedures (SUPPS)** have a status similar to that of PANS in that they are approved by the Council, but only for application in the respective regions. They are prepared in consolidated form, since certain of the procedures apply to overlapping regions or are common to two or more regions.

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*The following publications are prepared by authority of the Secretary General in accordance with the principles and policies approved by the Council.*

**Technical Manuals** provide guidance and information in amplification of the International Standards, Recommended Practices and PANS, the implementation of which they are designed to facilitate.

**Air Navigation Plans** detail requirements for facilities and services for international air navigation in the respective ICAO Air Navigation Regions. They are prepared on the authority of the Secretary General on the basis of recommendations of regional air navigation meetings and of the Council action thereon. The plans are amended periodically to reflect changes in requirements and in the status of implementation of the recommended facilities and services.

**ICAO Circulars** make available specialized information of interest to Contracting States. This includes studies on technical subjects.

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